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**ABSTRACT**

The Elementary Staffing Study was conducted to develop a formula for determining the allocation of personnel positions and services for individual elementary school campuses in the Austin Independent School District. The 1981-82 study was meant to identify factors to be considered in personnel assignment, to "weight" each factor, and to use the factors and weights in developing the allocation formula. Items to be accounted for include enrollment, program multiplicity, achievement levels, and socioeconomic status. The appendixes include a literature review of the Educational Resource Information Center (ERIC) database regarding staffing formula development and use, a school district staffing survey, and an interview with the Director of Staff Personnel. Each source was used to answer one or more evaluation questions, decision questions, and/or information need requirements. Study data and results are presented with the purpose and procedures for using each information source. (CM)

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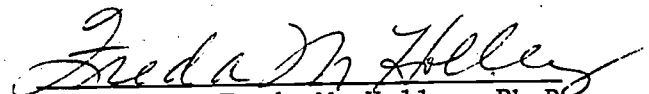
FINAL TECHNICAL REPORT  
Elementary Staffing Study

Secretary:  
Ruth Fairchild

June 30, 1982

Appendixes

Approved:

  
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Publication No. 81.42

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Elementary Staffing Study

Appendix A

LITERATURE REVIEW

## LITERATURE REVIEW

## Purpose

A search of the ERIC data base was performed in order to answer the following decision and evaluation questions from the Elementary Staffing Study Evaluation Design.

Decision Question D1: Should a weighted formula be used in allocating personnel to elementary campuses?

Evaluation Question D1-2: What guidelines can the professional literature offer about the development and use of a staffing formula?

## Procedure

The ERIC search was undertaken so that if a successful formula or formulas had been developed in another district or state, they could be examined for possible adoption in AISD. The search was initiated by a phone call to the CITE Resource Center. The problem was explained and CITE did the search. The printout from the search was read by the project evaluators and copies of promising citations were requested from CITE. When the microfiche were received, they were reviewed by an evaluation assistant who abstracted them.

## Results

The citations were of no value to the study. In general, they reported staff-to-student ratios for different geographic units (states, regions, and the Nation). Variations in staffing ratios between districts, which differ in size, wealth, etc. are presented, but procedures for allocating staff within or among districts are not discussed. Abstracts of the citations examined are included in Attachment A-1.

Goettel, R. The distribution of professional staff resources among the school districts of New York state. Albany: State University of New York, Institution for Educational Policy Research, May 1979.

In this study school districts were examined in terms of geographical location and property wealth per pupil in order to analyze the distribution of professional staff resources in the state of New York. The areas looked at were New York City, metropolitan New York City, metropolitan New York City suburbs, upstate suburbs, upstate cities, and non-metropolitan areas. To analyze the data collected from the districts in the study, district size was weighted. Ratios studied include teacher/pupil, administrative staff/pupil, support staff/pupil, and special subject staff/pupil. General findings indicate the highest wealth districts have the highest staffing patterns; while the lowest wealth districts have the lowest ratios.

Peifly, M., & Walling, P. A study of New Jersey staffing practices: A report to the State Board of Education. Trenton: New Jersey State Department of Education, April 1980.

This report discusses the results of a New Jersey school study to analyze trends in staff ratios during the past years. The study also measured the effects of grade organization type, community type, enrollment size, and district wealth on staffing ratios for 582 local districts in the state. A section of the report is devoted to guidelines for school staffing ratios borrowed from recommended or mandated ratios from other states and from professional educational organizations. The major conclusion of this report is that the current staff ratios appear to be unacceptable in terms of a local district's ability to provide a thorough and efficient system of education.

Phelps, J. L., & Addonizio, M. F. Staff adequacy in Michigan public schools, school finance project working paper #1, revised. Lansing: Michigan State Department of Education, October 17, 1979.

This paper examines statewide trends in the distribution of staff in the Michigan public schools. It provides a basis for analyzing the impact of state financing mechanisms and funding levels on the overall distribution of resources throughout the state and on the resource allocation and programmatic decisions of the individual school districts. A breakdown of aggregate staffing and staffing ratios are examined, and educational equity, equality, and excellence are discussed.

Ryder, K. F., & Juba, B. M. Analysis of the educational personnel system: VI, staffing patterns in U. S. local public schools. Washington, D.C.: Rand Corporation, February 1974.

This report examines the differences in the mix of professional and nonprofessional educational staff employed by local public schools of various levels, locations, and economic status. The differences reinforce the importance of 1) distinguishing regular classroom teachers from other teaching and supporting staff, and 2) reducing the reliance on aggregate pupil/teacher or pupil/total staff ratios as indicators of the relative quantity and/or quality of educational services.

This study uses unpublished data from a staff survey of local public schools conducted by the National Center for Educational Statistics in 1972.

Stemnock, S. K. School staffing ratios: Guidelines in literature, statute, and local policy. Washington, D.C.: American Association of School Administrators, National Education Association (Research Division), April 1972.

ERS used material from the NEA Research Division Staff Library, the ERIC microfiche collection, the Research Divisions Negotiation Research Unit, and information collected from all state departments of education and local school systems enrolling 12,000 or more pupils for their search. This report presents (without comment or evaluation) the various staffing ratios and formulas the search uncovered.

Vater, J. J., & Riddle, R. A. Analysis of nonprofessional school employee data, 1978-79, OMNI report. University Park: Pennsylvania School Study Council, 1978.

This report analyzed employee data for the following job categories: secretary, custodian, food service worker, paraprofessional, and supervisors of transportation, food service, and buildings and grounds. Two tables in the study included pupil/employee ratios for 1977-78 by job and state totals and by district size and wealth. All employee ratios were based on the "number of employees" divided into the "total district weighted average daily membership." An analysis of the data shows that the number of employees in each job classification is strongly related to the size and wealth of the district with district size as the dominant variable.



Vater, J. J., & Riddle, R. A. Analysis of professional salaries and staff ratios, 1978-79, OMNI report. University Park: Pennsylvania School Study Council, 1978.

This report contains data from 275 school districts in Pennsylvania collected for the 1978-79 school year. The data reflects policies and practices affecting salaries and staff utilization for professional employees. Ratios for professional employees and pupils were calculated from data based on weighted average daily membership, not enrollment. Ratios were calculated utilizing data from the PSSC OMNI Financial Analysis questionnaire and the DEAS-614, 1977-78 sent to the Pennsylvania Department of Education. Findings show that wealthy school districts tend to have better staffing patterns and lower class size than districts of low financial resources. Factors such as collective bargaining, district wealth, and district location may be influencing the results found with district size.

Elementary Staffing Study

Appendix B

SCHOOL DISTRICT STAFFING STUDY

Instrument Description; School District Staffing Survey

Brief description of the instrument:

The instrument consisted of three items: 1) Does your District use one or more staffing formulas to assign personnel units to specific campuses? 2) Please provide a brief description of each formula, and the factors taken into consideration in the use of each. 3) Are you satisfied with your staffing formula(s)?

To whom was the instrument administered?

The instrument was sent to the superintendents of the 97 largest school districts in the United States, Canada, and Puerto Rico.

How many times was the instrument administered?

Once.

When was the instrument administered?

November 1981.

Where was the instrument administered?

Not applicable.

Who administered the instrument?

The instrument was self-administered.

What training did the administrators have?

Not applicable.

Was the instrument administered under standardized conditions?

No.

Were there problems with the instrument or the administration that might affect the validity of the data?

None were identified.

Who developed the instrument?

The Office of Research and Evaluation.

What reliability and validity data are available on the instrument?

None.

Are there norm data available for interpreting the results?

No.

## SCHOOL DISTRICT STAFFING SURVEY

## Purpose

The School District Staffing Survey provided information relevant to the following decision and evaluation questions:

Decision Question 1: Should a weighted formula be used in allocating personnel to elementary campuses?

Evaluation Question D1-3: What guidelines can other school districts offer about the development and use of a staffing formula?

## Procedure

In November 1981, a School District Staffing Survey (Attachment B-1) was sent to the superintendents of the 97 largest school districts in the United States, Canada, and Puerto Rico. The school districts included in the sample are listed in Attachment B-2. A total of 67% (65) of the surveys were returned.

## Results

What guidelines can other school districts offer about the development and use of a staffing formula?

The survey responses were analyzed and the results are summarized in Attachment B-3. Examination of the results reveals most of the school districts responding to the survey use one or more staffing formulas. Most of the staffing formulas are based on student enrollment alone or on the number of classrooms in a school.

Although many of the school districts expressed an interest in considering other variables in their staffing formulas, only four of the districts have actually done so. An examination of the information provided by these districts revealed:

- a lack of specificity in the description of their formulas, or
- a failure to take into consideration all the variables in which AISD was interested, or
- a lack of applicability to the AISD system.

While the survey allowed an assessment of the current status of staffing formulas, it did not provide much guidance for the development of an AISD staffing formula. It became apparent that the development of multiple-factor staffing formulas is a relatively unexplored area in which creative problem solving will be required.

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AUSTIN INDEPENDENT SCHOOL DISTRICT  
Office of Research and Evaluation

## SCHOOL DISTRICT STAFFING SURVEY

☐ YES    ☐ NO    Does your district use one or more staffing formulas to assign personnel units to specific campuses?

If "no," return your survey to the address at the bottom of this page. If "yes," please continue.

Please check the box of each position for which you have a staffing formula.

- |   |  |
|---|--|
| <input type="checkbox"/> Teachers             | <input type="checkbox"/> Art Teachers                |
| <input type="checkbox"/> Assistant Principals | <input type="checkbox"/> Music Teachers              |
| <input type="checkbox"/> Counselors           | <input type="checkbox"/> Physical Education Teachers |
| <input type="checkbox"/> Librarians           | <input type="checkbox"/> Clerical Staff              |
|   | <input type="checkbox"/> Other: Please describe      |

Please provide a brief description of each formula, and the factors taken into consideration in the use of each. Some possible factors are: 1) enrollment, 2) number of compensatory education programs in operation, 3) student achievement, 4) socio-economic status of students, 5) number of bussed students due to desegregation, 6) number of minority students, and 7) number of special education students.

Are you satisfied with your staffing formula(s)? Why or why not?

Please return your completed survey, along with any written documentation that might be available, to:

Belinda Turner  
Austin Independent School District  
6100 Guadalupe, Box 79  
Austin, Texas 78752

SUPERINTENDENT OF SCHOOLS\*  
Birmingham City Public Schools  
2015 Park Pl.  
N. Birmingham, AL 35202

SUPERINTENDENT OF SCHOOLS\*  
Jefferson County Public Schools  
A-400 Courthouse Annex  
Birmingham, AL 35203

SUPERINTENDENT OF SCHOOLS\*  
Mobile County Public Schools  
P.O. Box 1327  
Mobile, AL 36601

SUPERINTENDENT OF SCHOOLS  
Mesa Unified School District  
549 N. Stapley Dr.  
Mesa, AZ 85203

SUPERINTENDENT OF SCHOOLS  
Phoenix Union HS District #210  
2526 W. Osborn Rd.  
Phoenix, AZ 85017

SUPERINTENDENT OF SCHOOLS\*  
Tucson Unified School District  
P.O. Box 40400  
Tucson, AZ 85717

SUPERINTENDENT OF SCHOOLS\*  
Fresno Unified School District  
Tulare and M Street  
Fresno, CA 93721

SUPERINTENDENT OF SCHOOLS\*  
Garden Grove  
10331 Stanford Ave.  
Garden Grove, CA 92640

SUPERINTENDENT OF SCHOOLS\*  
Long Beach Unified School District  
701 Locust Ave.  
Long Beach, CA 90813

SUPERINTENDENT OF SCHOOLS  
Los Angeles Unified School District  
450 N. Grand Ave. Rm G-265  
Los Angeles, CA 90012

SUPERINTENDENT OF SCHOOLS\*  
Mt. Diablo School District  
1936 Carlotta Dr.  
Concord, CA 94519

SUPERINTENDENT OF SCHOOLS\*  
Oakland Unified School District  
1025 2nd Ave. Rm 201  
Oakland, CA 94606

SUPERINTENDENT OF SCHOOLS\*  
Sacramento City Unified  
1619 N. St., P.O. Box 2271  
Sacramento, CA 95810

SUPERINTENDENT OF SCHOOLS\*  
San Diego Unified School District  
4100 Normal St., B-4  
San Diego, CA 92103

SUPERINTENDENT OF SCHOOLS  
San Francisco Public Schools  
500 Corbett  
San Francisco, CA 94131

SUPERINTENDENT OF SCHOOLS\*  
San Juan Public Schools  
3738 Walnut Ave.  
Carmichael, CA 95608

SUPERINTENDENT OF SCHOOLS  
Denver Public Schools  
900 Grant St.  
Denver, CO 80203

SUPERINTENDENT OF SCHOOLS  
Jefferson County R-1  
1209 Quail St.  
Lakewood, CO 80215

SUPERINTENDENT OF SCHOOLS  
Public Schools Dist. of Columbia  
415 12th St., N.W., Suite 1013  
Washington, D.C. 20004

SUPERINTENDENT OF SCHOOLS\*  
Broward County Public Schools  
1320 Southwest 4 St.  
Ft. Lauderdale, FL 33312

\* Indicates School District that sent in the Elementary Staffing Study Survey.

81.42  
SUPERINTENDENT OF SCHOOLS\*  
Dade County Public Schools  
1410 N.E. 2nd Ave., Rm 713  
Miami, FL 33132

SUPERINTENDENT OF SCHOOLS\*  
Duval County Public Schools  
1325 San Marco Blvd.  
Jacksonville, FL 32207

SUPERINTENDENT OF SCHOOLS\*  
Escambia County Public Schools  
904 N. 57th Ave.  
Pensacola, FL 32506

SUPERINTENDENT OF SCHOOLS\*  
Hillsborough County Public Schools  
P.O. Box 3408  
Tampa, FL 33601

SUPERINTENDENT OF SCHOOLS\*  
Orange County Public Schools  
434 N. Tampa Ave.  
Orlando, FL 32802

SUPERINTENDENT OF SCHOOLS\*  
Palm Beach County Public Schools  
3323 Belvedere Rd.  
West Palm Beach, FL 33402

SUPERINTENDENT OF SCHOOLS\*  
Pinellas County Public Schools  
P.O. Box 4688  
Clearwater, FL 33518

SUPERINTENDENT OF SCHOOLS  
Polk County Public Schools  
P.O. Box 391  
Bartow, FL 33830

SUPERINTENDENT OF SCHOOLS\*  
Atlanta Public Schools  
224 Central Ave., S.W.  
Atlanta, GA 30303

SUPERINTENDENT OF SCHOOLS\*  
Cobb County Public Schools  
P.O. Box 1088  
Marietta, GA 30060

SUPERINTENDENT OF SCHOOLS\*  
DeKalb County Public Schools  
3770 N. Decatur Rd.  
Decatur, GA 30032

SUPERINTENDENT OF SCHOOLS\*  
Dept. of Education  
P.O. Box 2360  
Honolulu, HI 96804

SUPERINTENDENT OF SCHOOLS  
Chicago Board of Education Dist. 299  
2021 N. Burling  
Chicago, IL 60614

SUPERINTENDENT OF SCHOOLS\*  
Des Moines Ind. Comm. Sch. Dist.  
1800 Grand Ave.  
Des Moines, IA 50307

SUPERINTENDENT OF SCHOOLS\*  
Indianapolis Indiana Public Schools  
120 East Walnut St.  
Indianapolis, IN 46204

SUPERINTENDENT OF SCHOOLS\*  
USD #259, Wichita Public Schools  
428 South Broadway  
Wichita, KS 67202

SUPERINTENDENT OF SCHOOLS\*  
Jefferson County Public Schools  
3332 Newburg Rd.  
Louisville, KY 40218

SUPERINTENDENT OF SCHOOLS\*  
Caddo Parish Public Schools  
P.O. Box 37000  
Shreveport, LA 71130

SUPERINTENDENT OF SCHOOLS  
East Baton Rouge Public Schools  
P.O. Box 2950  
Baton Rouge, LA 70821

SUPERINTENDENT OF SCHOOLS  
Jefferson Parish Public Schools  
519 Huey P. Long  
Gretha, LA 70053

\* Indicates School District that sent in the Elementary Staffing Study Survey.

SUPERINTENDENT OF SCHOOLS\*  
 Orleans Parish Public Schools  
 4100 Toure Street  
 New Orleans, LA 70122

SUPERINTENDENT OF SCHOOLS  
 Portland Maine Public Schools  
 331 Veranda St.  
 Portland, ME 04103

SUPERINTENDENT OF SCHOOLS\*  
 Anne Arundel County Public Schools  
 2644 Riva Rd.  
 Annapolis, MD 21401

SUPERINTENDENT OF SCHOOLS  
 Baltimore City Public Schools  
 2801 N. Dukeland St.  
 Baltimore, MD 21216

SUPERINTENDENT OF SCHOOLS\*  
 Baltimore County Public Schools  
 6901 N. Charles St.  
 Towson, MD 21204

SUPERINTENDENT OF SCHOOLS  
 Montgomery County Public Schools  
 850 Hungerford Dr.  
 Rockville, MD 20850

SUPERINTENDENT OF SCHOOLS\*  
 Prince George's County Public Schools  
 Upper Marlboro, MD 20870

SUPERINTENDENT OF SCHOOLS  
 Boston Public Schools  
 26 Court St.  
 Boston, MA 02108

SUPERINTENDENT OF SCHOOLS\*  
 City of Detroit Public Schools  
 5057 Woodward  
 Detroit, MI 48202

SUPERINTENDENT OF SCHOOLS  
 Minneapolis Public Schools  
 807 N.E., Boradway  
 Minneapolis, MN 55413

SUPERINTENDENT OF SCHOOLS\*  
 St. Paul Public Schools  
 360 Colborne St.  
 St. Paul, MN 55102

SUPERINTENDENT OF SCHOOLS\*  
 Kansas City Public Schools  
 1211 McGee  
 Kansas City, MO 64106

SUPERINTENDENT OF SCHOOLS  
 St. Louis Public Schools  
 1517 S. Theresa Ave.  
 St. Louis, MO 63104

SUPERINTENDENT OF SCHOOLS\*  
 Omaha Public Schools  
 4469 Farnam St.  
 Omaha, NE 68131

SUPERINTENDENT OF SCHOOLS\*  
 Clark County School District  
 2832 E. Flamingo Rd.  
 Las Vegas, NV 89121

SUPERINTENDENT OF SCHOOLS  
 Newark Board of Education  
 2 Cedar St.  
 Newark, NJ 07102

SUPERINTENDENT OF SCHOOLS\*  
 Albuquerque Public Schools  
 P.O. Box 25704  
 Albuquerque, NM 87125

SUPERINTENDENT OF SCHOOLS\*  
 Buffalo City School District  
 708 City Hall  
 Buffalo, NY 14202

SUPERINTENDENT OF SCHOOLS\*  
 New York City Public Schools  
 110 Livingston St.  
 Brooklyn, NY 11201

SUPERINTENDENT OF SCHOOLS\*  
 Mecklenburg Public Schools  
 Box 149  
 Charlotte, NC 28230

\* Indicates School District that sent in the Elementary Staffing Study Survey.



SUPERINTENDENT OF SCHOOLS\*  
Wake County Public Schools  
P.O. Box 28041  
Raleigh, NC 27611

SUPERINTENDENT OF SCHOOLS\*  
Winston-Salem Forsyth County  
P.O. Box 2513  
Winston-Salem, NC 27102

SUPERINTENDENT OF SCHOOLS  
Akron City Public Schools  
70 N. Broadway  
Akron, OH 44308

SUPERINTENDENT OF SCHOOLS  
Cincinnati Public Schools  
230 E. Ninth St.  
Cincinnati, OH 45202

SUPERINTENDENT OF SCHOOLS\*  
Cleveland Public Schools  
1380 East 6th St.  
Cleveland, OH 44114

SUPERINTENDENT OF SCHOOLS\*  
Columbus Public Schools  
270 East State  
Columbus, OH 43215

SUPERINTENDENT OF SCHOOLS  
Dayton City Public Schools  
348 W. First St.  
Dayton, OH 45402

SUPERINTENDENT OF SCHOOLS  
Toledo Public Schools  
Elm St. and Manhattan Blvd.  
Toledo, OH 43608

SUPERINTENDENT OF SCHOOLS\*  
Oklahoma City Public Schools  
900 N. Klein  
Oklahoma City, OK 73106

SUPERINTENDENT OF SCHOOLS\*  
Tulsa Public Schools  
P.O. Box 45208  
Tulsa, OK 74145

SUPERINTENDENT OF SCHOOLS\*  
Eugene School District 4J  
200 North Monroe  
Eugene, OR 97404

SUPERINTENDENT OF SCHOOLS\*  
Portland Public Schools  
501 North Dixon  
Portland, OR 97227

SUPERINTENDENT OF SCHOOLS\*  
Philadelphia Public Schools  
Parkway at 21st St.  
Philadelphia, PA 19103

SUPERINTENDENT OF SCHOOLS  
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Office 506, Apartado 759  
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SUPERINTENDENT OF SCHOOLS  
Charleston County Public Schools  
3 Chisolm St.  
Charleston, SC 29401

SUPERINTENDENT OF SCHOOLS\*  
Greenville County Public Schools  
P.O. Box 2848  
Greenville, SC 29645

SUPERINTENDENT OF SCHOOLS  
Memphis City Public Schools  
2597 Avery St.  
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SUPERINTENDENT OF SCHOOLS\*  
Metropolitan Public Schs. Nashville  
2601 Bransford Ave.  
Nashville, TN 27204

SUPERINTENDENT OF SCHOOLS\*  
Milwaukee Public Schools  
P.O. Drawer 10 K  
Milwaukee, WI 53201

SUPERINTENDENT OF SCHOOLS\*  
Corpus Christi ISD  
801 Leopard  
Corpus Christi, TX 78403

\* Indicates School District that sent in the Elementary Staffing Study Survey.

SUPERINTENDENT OF SCHOOLS\*  
Dallas Independent School Dist.  
3700 Ross Ave.  
Dallas, TX 75204

SUPERINTENDENT OF SCHOOLS\*  
El Paso Independent School Dist.  
6531 Boeing St.  
El Paso, TX 79925

SUPERINTENDENT OF SCHOOLS  
Ft. Worth Independent School Dist.  
3210 West Lancaster  
Fort Worth, TX 76107

SUPERINTENDENT OF SCHOOLS  
Houston Independent School Dist.  
3830 Richmond Ave.  
Houston, TX 77027

SUPERINTENDENT OF SCHOOLS\*  
San Antonio Independent School Dist.  
141 Lavaca St.  
San Antonio, TX 78210

SUPERINTENDENT OF SCHOOLS\*  
Granite School District  
340 East 3545 South  
Salt Lake City, UT 84115

SUPERINTENDENT OF SCHOOLS  
Dept. of Defense Overseas Dep. Schs.  
2461 Eisenhower Ave., Hoffman I, 172  
Alexandria, VA 22151

SUPERINTENDENT OF SCHOOLS\*  
Fairfax County Public Schools  
10700 Page Ave.  
Fairfax, VA 22030

SUPERINTENDENT OF SCHOOLS\*  
Norfolk Public Schools  
P.O. Box 357  
Norfolk, VA 23501

SUPERINTENDENT OF SCHOOLS  
Virginia Beach City Public Schools  
P.O. Box 6038  
Virginia Beach, VA 23456

SUPERINTENDENT OF SCHOOLS\*  
Seattle Public Schools  
815 Fourth Ave., N  
Seattle, WA 98109

SUPERINTENDENT OF SCHOOLS\*  
Kanawha County Schools  
200 Elizabeth St.  
Charleston, WV 25311

SUPERINTENDENT OF SCHOOLS  
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SUPERINTENDENT OF SCHOOLS\*  
Edmonton Public Schools  
10010-107A Ave.  
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SUPERINTENDENT OF SCHOOLS\*  
Vancouver Public Schools  
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Vancouver, BC V6J 1Z8 Canada

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North York Board of Education  
21 Eddfield Ave.  
Willowdale, Ontario M2N 2M5 Canada

SUPERINTENDENT OF SCHOOLS  
Ottawa Board of Education  
330 Gilmour St.  
Ottawa, Ontario K2P 0P9 Canada

\* Indicates School District that sent in the Elementary Staffing Study Survey.

## Summary of School District Staffing

## Survey Responses

*Does your district use one or more staffing formulas to assign personnel units to specific campuses?*

11 No

53 Yes

1 No reply

*Please provide a brief description of each formula, and the factors taken into consideration in the use of each.*

Forty-nine of the 53 School districts with a staffing formula use formulas based entirely or almost entirely on enrollment or number of classrooms. Only four school districts deviated from these procedures. The formulas used by these school districts are described below.

Dallas Independent School District  
Dallas, Texas

A weighted pupil approach is used for the distribution of teacher resources. Each regular elementary school student is allocated on a basis of six hours of instruction per day and each hour of regular instruction is weighted as 1.0. Each hour of remedial instruction is weighted as 1.5. Each specially funded course or class carries the weight mandated by the funding source.

The Dallas Independent School District states that many small elementary schools can easily be managed on a part-time basis. The school district recommends that those elementary schools K-3 or K-6 with student bodies in the neighborhood of 300 or fewer students be paired under the responsibility of one administrator.

Omaha Public Schools  
Omaha, Nebraska

A teacher staffing formula is used that considers enrollment, number of compensatory education programs in operation, and number of special education students. In addition, attention is given to Board policy which currently calls for maintaining class sizes of 20 to 30 students.

Broward County Public Schools  
Ft. Lauderdale, Florida

Funds are allocated to each school on the basis of a formula that takes into consideration enrollment, the socio-economic status of the students, and the number of special education students. Each principal staffs within the constraints of the lump sum the school receives.

Buffalo City School District  
Buffalo, New York

The survey indicates the factors in the formula include enrollment, the services offered by the school, and the needs of the school. The formula itself was not provided.

-----

Mt. Diablo School District of Concord, California, uses an enrollment formula, but takes into account other data in making final decisions. These data are available, but are not a feature of the actual formula. Schools receive scores in each of the following categories: Number of low-income students, educational level of the head of household, mobility of student population, reading test scores, number of personnel supervised, number of pupils transported, enrollment, and age of staff.

The Metropolitan Public Schools in Nashville, Tennessee does not use a staffing formula but does make some special staffing considerations. A one or two pupil-per-class lower ratio is provided for certain schools falling under their court order and experiencing significant cross-community bussing. Also, if a school's standard ratio is one teacher per 29 students, all situations meriting special dispensation are applied as credits against the 29. For example, advanced placement classes are held to 20 students, so a credit of nine "student hours" is recorded. All such credits are totaled and divided by the standard load of 145 (5 periods x 29 per period) to determine the additional staff required. They have found this to be an effective method for "weighting" factors that make a school or individual class unique.

*Are you satisfied with your staffing formula(s)?*

22 Yes

9 No

34 No reply

Elementary Staffing Study

Appendix C

PERSONNEL INTERVIEW

## Instrument Description: Personnel Interview

Brief description of the instrument:

The interview form consisted of three questions: 1) How are pupil-teacher ratios developed for AISD schools? 2) How are pupil-teacher ratios used in staffing AISD schools? 3) Are formulas used in allocating counselors, special education teachers, assistant principals, or helping teachers?

To whom was the instrument administered?

The Director of Staff Personnel.

How many times was the instrument administered?

Once.

When was the instrument administered?

January 8, 1982.

Where was the instrument administered?

In the Director's office.

Who administered the instrument?

A District Priorities Evaluator.

What training did the administrators have?

Basic instruction in conducting interviews.

Was the instrument administered under standardized conditions?

Not applicable.

Were there problems with the instrument or the administration that might affect the validity of the data?

No.

Who developed the instrument?

The Office of Research and Evaluation.

What reliability and validity data are available on the instrument?

None.

Are there norm data available for interpreting the results?

No.

## PERSONNEL INTERVIEW

## Purpose

The Personnel Interview provided information relevant to the following decision and evaluation questions:

Decision Question 1: Should a weighted formula be used in allocating personnel to elementary campuses?

Evaluation Question D1-1: What procedures are currently used to allocate personnel to AISD elementary campuses?

## Procedure

An appointment was made with the Director of Staff Personnel for January 8, 1982. The interview was conducted in the Director's office by a District Priorities Evaluator.

## Results

Evaluation Question D1-1: What procedures are currently used to allocate personnel to AISD elementary campuses?

The information in this appendix is organized according to the questions addressed on the interview form.

How are pupil-teacher ratios developed for AISD schools?

The pupil-teacher ratios used at the elementary level during 1981-82 are provided in Attachment C-1. This attachment also shows the guidelines used in allocating librarians, as well as art, music, physical education, band, and orchestra teachers.

According to the Director of Staff Personnel, the pupil-teacher ratios are reevaluated at the end of each school year. Recommendations from Personnel and Elementary and Secondary Instruction are presented to the Superintendent and discussed. In making the final decision, consideration must be given to the effect that any changes in the ratios might have upon the school district's budget and total staffing patterns. The Director of Staff Personnel stated the ratios normally do not show significant changes from year-to-year, and when changes do occur there is a tendency to reduce, rather than increase the ratios.

How are the ratios used in staffing schools?

Once the ratios for the upcoming year have been established, campus and

grade-level enrollment projections are obtained for each school from the Director of Planning/Programming. Personnel studies the situation at each school to determine how many teachers will be needed to obtain the specified pupil-teacher ratios. This requires looking at each grade-by-grade ratio within the school and then examining the staffing needs of the whole school as well. Enrollment is the prime consideration, except in those instances where obvious compensations must be made (e.g., the school has very small classrooms, is a Title I school-wide project, etc.).

In the past, input has not been solicited from principals in the allocation of classroom teachers. However, after Personnel completed the classroom teacher allocations for 1981-82, the Superintendent and the Acting Director of Elementary Education added teachers to campuses because of unique needs caused by the desegregation order. In this instance, principal input to the Acting Director of Elementary Education had an impact on the distribution of classroom teachers.

Are formulas used in allocating counselors, special education teachers, assistant principals, or helping teachers?

The Department of Special Education is responsible for allocating the special education teachers to campuses.

There is no formula for allocating counselors or helping teachers to schools. However, the following questions serve as guidelines in making decisions:

- 1) Is the school a Title I school? If so, comparability must be maintained.
- 2) To what extent has the school been affected by desegregation?
- 3) What is the school's enrollment?
- 4) What other resources are available at the school (e.g., assistant principals)?

The Director of Staff Personnel stated the assignment of assistant principals and head teachers is a cabinet-level decision. In the past, such decisions were made by the Superintendent with input from the Director of Elementary Education.

The Director of Staff Personnel stated that staffing should be done first by position and then by team for each school. He prefers the development of two types of staffing formulas: 1) a staffing formula for each position, and 2) a staffing formula for the total team at a school.



**AUSTIN INDEPENDENT SCHOOL DISTRICT**

DIVISION OF HUMAN RESOURCES

March 23, 1981

## MEMORANDUM

TO: Mr. Perry Jackson  
FROM: Wayne A. King  
SUBJECT: Proposed Staffing Formula for the 1981-82  
School Year

I am proposing that we use the same staffing formula for 1981-82 as we did for this year.

Regular Classroom Teachers:

Kindergarten and First Grade	1:22
Second and Third Grades	1:26
Fourth thru Sixth Grades	1:28

Librarians:

Full Time Librarian - over 300 enrollment  
Half Time Librarian - under 300 enrollment

Special Area Teachers - Music, and Physical Education:

Kindergarten thru Third Grades	- 1 Unit 300
Fourth thru Sixth Grades	- 1 Unit 230

Art:

Kindergarten thru Third Grades	- None
Fourth thru Sixth Grades	- 1 Unit 700

Band and Orchestra - Based on number of students who have enrolled in the program.

Sixth Grade Only	- 1 Unit 260
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Attached for your information are the following items: 1) Senate Bill No. 1 information, 2) memorandum to Dr. Gaines explaining the staffing formulas for 1980-81, and 3) teacher-pupil ratio for October 3, 1980.

dg.  
Att.

Elementary Staffing Study

Appendix D

FORMULA DEVELOPMENT

Brief description of the data file:

A number of files containing descriptive data on AISD schools for school years 1980-81 and 1981-82 are in permanent file set A954 at the University of Texas. SPSS control card files for these data are also contained in the permanent file set. See Attachment D-5.

Which students or other individuals are included on the file?

All AISD elementary schools.

How often is information on the file added, deleted, or updated?

Not updated on a regular basis.

Who is responsible for changing or adding information to the file?

N/A.

How was the information contained on the file gathered?

From various district files and reports.

Are there problems with the information on the file that may affect the validity of the data?

None that are known.

What data are available concerning the accuracy and reliability of the information on the file?

N/A.

Are there normative or historical data available for interpreting the results?

N/A.

Brief description of the file layout:

See SPSS control cards for the file of interest.

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## FORMULA DEVELOPMENT

### Purpose

This appendix chronicles the development of several formulas for allocating staff to elementary campuses. It contains information relevant to the following decision and evaluation questions from the Elementary Staffing Study Evaluation Design:

Decision Question D1: Should a weighted formula be used in allocating personnel to elementary classrooms?

Evaluation Question D1-4: What factors should be used in a staffing formula for AISD elementary schools?

Evaluation Question D1-5: What weight should be assigned to each factor?

Evaluation Question D1-6: What is the outcome when weights are applied?

Evaluation Question D1-7: What advantages and disadvantages would be associated with the use of the devised staffing formula?

### Procedures and Results

The formula development portion of the Elementary Staffing Study was done in steps, and often the outcome of one step was an input at the next step. For that reason, the procedures and results sections of this appendix will be combined so that the flow of the activities can best be described.

#### Introduction

The task at hand was to explore the possibility of developing formulas to allocate staff to elementary schools, taking into account factors such as student socioeconomic status, student achievement level, the number of special programs at the school, the percentage of students who were served by special education, etc. As the work progressed several criteria of useful formulas and principles to guide their implementation began to emerge and were used in the development of the formulas. The principles are presented here so that the reader can both assess their adequacy and the extent to which the resulting formulas and recommendations are consistent with them.

1. The purpose of the formula is to introduce information in addition to enrollment into the process for allocating staff to schools. Basically that means making an allocation based on enrollment and adjusting for the relevant variables.
2. The variables thought to be relevant must be measurable.
3. The outcome of using the formula should be consistent with the purpose for using it; i.e., the results should be valid. An examination of the results should reveal a close relationship with what was anticipated prior to use. If the outcome is not consistent with what is desired, then the formula should be changed. (It is unlikely, however, that the results will exactly match the user's expectations because the formula has more specific knowledge about the variables of interest than the user. Since the formula may be more objective than the user, it may produce surprising results which provide new information to the user. In such cases the user may want to accept the formula rather than revise it as suggested above.)
4. The formula should have a just impact on the schools. Extraneous factors should not alter the impact of the formula. For example, in assigning teachers where changes in the pupil/teacher ratio (PTR) can be taken as a measure of the impact, the range of change should be essentially the same for small and large schools.
5. If one is not careful, a formula can overadjust; for example, a school might end up with a 50-to-1 pupil/teacher ratio. Some mechanism must be developed to prevent excessive adjustment.
6. Conversely, the formula must make an adjustment that is large enough to be real. For example, a formula to assign assistant principals would be a sham if the resulting allocation did not differ from that obtained using membership alone.
7. For our purposes, the formula should not add existing staff. The result should be a redistribution of staff.
8. It is not appropriate to assign all positions using a formula. For example, each school gets one principal.
9. Unique schools should be treated separately. The W. R. Robbins alternative school would be an example at the secondary level.
10. The use of a formula cannot remove the impact of individual decision makers from the resource allocation process. Extraneous factors will influence the actual implementation of the formula. For example, small classroom size might keep the PTR at a school lower than the formula would suggest. Or in small schools, meaningful deviations from the formula may occur when the actual assignment of teachers to grades is made. In some cases political situations may force a deviation from the formula; however, once a formula is established, the political cost of making deviations must also be weighed.

11. The District should not become a slave to the formula. As conditions change, the variables used in a formula should probably change. Even if the variables do not change, the relative impact they have on the outcome may need to be changed. If a formula is adopted, remaining in control of the formula (making appropriate changes) may prove to be very difficult in the long run. The formula may develop a momentum that resists change.

As work progressed, it became evident that time did not exist for developing formulas for each elementary staff position. Therefore, at a meeting of representatives of ORE, Elementary Education, and the Personnel Office, it was decided to limit the formulas in 1981-82 to classroom teachers, assistant principals, helping teachers, and counselors.

The remainder of the appendix traces the formula development process for each position individually. First is the classroom teacher formula.

#### Classroom Teachers

The first step in developing the classroom teacher formula was to develop a conceptual scheme which would meet the basic demands which were

- a. that the formula should be weighted so that schools of the same size might receive a different number of teachers depending on the characteristics of the school and/or student body, and
- b. that the total number of teachers employed by the District should remain the same.

The approach selected was based on a formula with the general form given below:

$$\begin{array}{l} \text{Number of} \\ \text{Teachers} \end{array} = \text{BASE} + \text{ADJUSTMENT} \quad (1)$$

The BASE portion of equation 1 allocates an initial number of teachers to each school based on enrollment. BASE is determined by equation 2.

$$\text{BASE} = \frac{E}{P} \quad (2)$$

E is the enrollment at the school and P is the average District pupil/teacher ratio (PTR).

The ADJUSTMENT portion of the formula "fine tunes" the allocation by adding to or subtracting from the original number. The general formula for the ADJUSTMENT is given in equation 3.

$$\text{ADJUSTMENT} = W_1Z_1 + W_2Z_2 + W_3Z_3 + \dots + W_NZ_N \quad (3)$$

The Z's in equation 3 are the school's values on the variables used to adjust the BASE allocation. They are expressed as z-scores so that the overall impact of each variable on the total number of positions to be allocated across schools is zero. The W's represent weights which determine the relative impact of the variables being used in the adjustment. Choosing the proper weights allows the user to choose the impact each variable will have on the outcome relative to the others. Those variables determined by the user to be the most important are given larger weights than the others; therefore, they have a bigger impact on the resulting ADJUSTMENT value for each school.

The implementation of the scheme has three steps.

- A. The user must select the variables for use in the ADJUSTMENT.
- B. The relative importance of the variable in calculating the ADJUSTMENT must be determined.
- C. The actual weights to be used in the formula must be set. Then the analyses are done to make the allocation.

The following paragraphs describe the three steps in detail. The control cards and data files used in all analyses in this appendix are in a permanent file set at the University of Texas (PF A954). They are listed in Attachment D-1.

#### A. Selecting the Variables:

The first step was to create a list of variables that might possibly be used in a formula. The variables included were those thought to have the greatest relevance to the activities of the classroom teachers. The question to generate the list was, "What student or school characteristics make the job of the classroom teacher more difficult or stressful." The variables considered for the formula are listed in Figure D-1.

The number of variables that can be considered is much greater than the number that can be used effectively in a formula. For the formula to work best, the variables used should not be redundant. That is, two variables which in essence measure the same thing do not add anything to the formula. They merely load the formula in favor of that influence.

Therefore, the second step in selecting the variables was to statistically group them to determine which ones measured the same influences. This was done through factor analysis. Initial attempts at the factor analysis used enrollment as one of the variables, and analyses were conducted separately for all schools, K-6 schools only, K-3 schools



only, and K, 4-6 schools only. Inspection of these results indicated that enrollment should be removed as a variable. Because enrollment was already included in the BASE portion of the formula its effect needed to be removed from the ADJUSTMENT part. Otherwise, larger schools with a greater number of Special Education students, for example, might receive extra help when the percentage of Special Education students was actually low. Therefore, enrollment was removed from the factor analyses, and each variable that represented a number of students rather than a percentage of students was divided by the enrollment.

A principle axes solution with iterations and with oblique rotation was used. The computer output is presented as Attachment D-2. Four different oblique solutions were obtained. Except for minor fluctuations in the size of the factor loadings the results were essentially the same for each solution. Three factors were identified. Figure D-2 shows how the measures grouped together to define the factors. Except for IMPACT, each variable clearly loaded on one factor. IMPACT tended to load about equally on factors 1 and 2. Conceptually, IMPACT seemed more a measure of student diversity than economic or educational deprivation, so it was placed on factor 2.

The results of the factor analysis were then used to choose the single variable to represent each factor. Factor loading and the ease with which the variable could be collected each year were important in making the selection. The percent low income was chosen for factor 1. QUADIF, the measure of achievement diversity was chosen for factor 2, and the percentage of special education students was chosen for factor 3. Therefore, when the formula was completed, it would reduce the PTR of schools where the teachers had greater than the average number of low income or special education students in their classes or when their classes had a wide range of achievement.

#### B. Determining the Relative Impact of the Variables:

The Assistant Superintendent for Elementary Education has an Advisory Principals' Team which reviewed the work on the formula. They set the relative importance of the three variables at 3.5, 3, and 1 for achievement diversity, percent low-income, and percent special education respectively. In setting these weights, they were making the statement that the achievement diversity and low-income status of the students a teacher works with should have about equal weight in raising or lowering the PTR and that these two influences should be weighted three and a half and three times as strongly as the percentage of special education students.

#### C. Assigning the Actual Weights and Producing the Allocations:

The presentation of this step will be done in two parts. First will be a discussion of the allocation formula in more detail. Then the procedures used to set the weights and get the allocations will be discussed.

The first runs were done on a trial basis for presentation to the Assistant Superintendent for Elementary Education and the Assistant



Director of Personnel to determine the feasibility of the approach. The relative importance of the variables used in the adjustment were set by the evaluator who did the analyses. The results are reported in Attachment D-3.

The analyses described in Attachment D-3 used the District average PTR as the denominator in the calculation of BASE (see equation 2). It was later learned that external requirements required that the PTR be lower in the early grades. Therefore, the ratios given in Attachment D-4 were used in subsequent calculations. The resulting formula for BASE was as follows:

$$\text{BASE} = ((\text{GrK} + \text{Gr1})/22) + ((\text{Gr2} + \text{Gr3})/26) + ((\text{Gr4} + \text{Gr5} + \text{Gr6})/28) \quad (4)$$

In the BASE portion of the formula, GrK, Gr1, etc., refer to the projected enrollment at each grade. The BASE value then is an unrounded number of teachers to be assigned using Personnel's staffing ratios. On the average, the BASE portion gives lower PTR's to K-3 schools, intermediate PTR's to K-6 schools, and higher PTR's to K,4-6 schools.

As work progressed in using the formula, it became clear that the ADJUSTMENT formula in equation 3 was not adequate. It tended to overadjust small schools and underadjust large schools. The ADJUSTMENT value for a school from equation 3 is independent of school size. The outcome of the formula is the number of teachers by which to adjust the BASE value. If the BASE value is small, the adjustment has a greater impact proportionally on the teacher allocation than if BASE is large. Therefore, ADJUSTMENT had to be modified to reflect school size. The resulting formula follows.

$$\text{ADJUSTMENT} = \frac{W_1Z_1 + W_2Z_2 + \dots + W_NZ_N}{E/A} \quad (5)$$

Equations 4 and 5 together make up the elementary teacher formula in its final form. The variables used in the formula are as follows:

GRK to GR6	Projected 1982-83 enrollment at grades K-6 at each school.
LOWINCZ	The percentage of students receiving a free or reduced-priced lunch or having a sibling who does expressed as a z-score. The data were taken from the Student Master file.
QUADIFZ	The mean interquartile range of 1981 ITBS Composite scores expressed as a z-score.
SPEZ	The spring, 1982, percentage of students served by Special Education expressed as a z-score.
TOTENRL	The projected 1982-83 enrollment.

These data and the SPSS control cards found in Attachment D-5 were then used to allocate teaching positions. The weights ( $W_1, W_2$ , etc.) in equation 5 determine the degree to which the formula adds or subtracts staff. If the weights are too small, the adjustment has no meaningful impact. If the weights are too large, some schools would have "unacceptably high" PTR's, and others would have "unacceptably low" PTR's. Therefore, the size of the weights must be kept within reasonable limits. Ordinarily, the weights suggested in part B above cannot be used directly in the formula. What is important is that the weights which are used maintain the same ratios to each other that the original weights had.

An iterative, trial and error approach was used to determine the actual weights. The choice of the best solution was based on two conditions.

1. The adjustment (i.e., the weights in the formula) must be as large as possible.
2. The resulting unrounded pupil/teacher ratio at no school should go either below a given minimum or above a given maximum. For the purpose of these analyses those limits were set at 20-to-1 and 30-to-1.

For the actual analyses the original weights were first set at one tenth of their value (i.e., .35, .3, and .1) and multiplied by a variable WEIGHT (see Attachment D-5). The general procedure then was to run the analysis with WEIGHT having a certain value and to calculate the resulting PTR for each school. If the PTR's all remained within limits, the variable WEIGHT was increased and the analyses were done again. If one or more PTR exceeded the limits, then a lower value was assigned to WEIGHT and the procedure was run again. Through this method, the value for WEIGHT that maximized the adjustment without exceeding the PTR limits was determined. Figure D-3 displays the values of WEIGHT used in the analyses in the order entered. Note that the value of 2.03 is the largest value of WEIGHT that does not cause the PTR of at least one school to exceed the limits. The final teacher allocation formula is given below.

$$\begin{array}{l} \text{Number of} \\ \text{Teachers} \end{array} = \text{BASE} + \text{ADJUSTMENT} \quad (1)$$

where

$$\text{BASE} = ((\text{GrK} + \text{Gr1}/22) + (\text{Gr2} + \text{Gr3}/26)) + ((\text{Gr4} + \text{Gr5} + \text{Gr6})/28) \quad (4)$$

and

$$\text{ADJUSTMENT} = ((.7105 * \text{QUADIFY}) + (.609 * \text{LOWINCZ}) + (.203 * \text{SPEZ})) \quad (6)$$

$$(\text{TOTENRL}/467.77)$$

The value 467.77 is the average school size. Notice that the weights .7105, .609, and .203 maintain the proper ratio of 3.5:3:1. The weights

for each value of WEIGHT in Figure D-3 also maintain that same ratio.

Teacher Formula Results: The results of applying the formula can be found in Figure D-4. The range of the adjustment was from -4.39 to +1.786 teachers; i.e., one school lost 4.39 teachers and one school gained 1.786 teachers. The average adjustment was +.809 teachers. The resulting range of PTR (calculated by dividing the projected enrollment by the number of teachers rounded off to the nearest whole number) was from 21.8 at Bryker Woods to 29.9 at Doss with an average of 25.5. If conditions existed so that the projected number of teachers rounded to the nearest whole number could be assigned to the schools, 36 of the 61 schools would get a different number than they would if the rounded BASE values were used.

The formula appears to have a differential impact on schools depending on their grade spans. AISD has basically three grade span arrangements at the elementary level--K-3, K,4-6, and K-6. Figure D-5 compares the average PTR's for these three types of schools when PTR is calculated two different ways. The first PTR is the BASE PTR which is equal to the total projected enrollment divided by the BASE teacher allocation rounded to the nearest whole teacher. The second PTR, the adjusted PTR, is equal to the total enrollment divided by the number of teachers assigned by the formula rounded to the nearest teacher. Adjustment by the formula seems to raise the PTR slightly for K-3 and K,4-6 schools and to lower it slightly for K-6 schools. Why the formula works in this way is not clear.

What Have We Learned? First we have learned that it is possible in principle to redistribute teacher positions equitably so that information other than enrollment is taken into account in making assignments.

What is less clear is whether the particular combination of variables and weights in this formula produces results that are satisfactory to those involved. The research literature does not seem equal to the task of determining what the weights and variables should be. Those decisions must be made by some person or group if the formula is to be used. Who is to make the decisions and how remains unclear.

That the step from producing the adjusted allocation to actually assigning a number of teachers to each grade at each school is a large step is clear. The extent to which the modified numbers can be maintained in the face of the realities of the law and particular school conditions remains to be seen.

#### Assistant Principals and Helping Teachers

The approach to developing a formula for assistant principal and helping teacher positions was much the same as that used in creating the teacher formula. Possible variables for inclusion in the formula were generated at a January 28, 1982, meeting between representatives of the Departments of Personnel and Elementary Education and ORE. They are presented in Figure D-6.

Factor analyses were performed in the same way as for the teacher variables. The results are presented in Attachment D-6. Figure D-7 presents the factors identified by the analysis and the items loading on each. The item chosen to represent the factor in the formula is the one listed first for the factor. Equation (7) is the result.

$$\begin{aligned} \text{Number of Assistant Principals} = & \frac{\text{TOTENRL}}{1137.63} + (W_1 * \text{LOWINCZ}) + (W_2 * \text{PCTSPEZ}) + (W_3 * \text{PCTSABZ}) + \\ & (W_4 * \text{AVERZ}) + (W_5 * \text{PCTPCZ}) + (W_6 * \text{PCTSSCZ}) \quad (7) \end{aligned}$$

TOTENRL      The total enrollment of the school.

1137.63      The average student to assistant ratio. It is calculated by dividing the total number of elementary students by the total number of assistant principals and helping teachers.

$W_1$  to  $W_6$       The weights applied to the variables in making the adjustment. They have the relative values given in Figure D-8.

LOWINCZ to PCTSSCZ      The corresponding variables defined in Figure D-6 expressed as z-scores.

In developing the teacher formula, the impact of the adjustment could be monitored and limited by setting bounds on the resulting pupil-teacher ratio. The choice of a limiting factor in developing a formula for assistant principals and helping teachers was not as straightforward.

The formula described above was run with several settings of the weights, and the results showed that limiting the degree of adjustment is very important. Figure D-9 provides a rank ordering of the schools under several different conditions. The column on the left shows the schools ranked by 1980-81 enrollment. The columns with headings of .02 to .10 show the changes as an adjustment was applied. On the left, the adjustment is small. It increases from left to right across the page. The dotted line across the middle of the page separates the top 19 from the remaining 42 schools. Since there were 19 assistant principals and helping teachers in 1980-81, the line separates those schools that would and would not receive administrative help in a system that gave an assistant principal or a helping teacher to the top 19 ranked schools. The column on the right, the ranking with the most adjustment, shows how the adjustment can be overdone. Houston, the largest elementary school in the District would not get an assistant using this ranking. The difficulty is knowing at what level enough adjustment has occurred but not too much.

Formula 7 and the results were reviewed by the Advisory Principals' Team. They suggested that the variables AVERZ (average achievement level) and PCTSSCZ (percentage of students in self-contained special education classrooms) be dropped from the formula. Furthermore, they suggested that the percentage of students with records on the Disciplinary Action File (PCTDAZ) be added. They suggested the weights listed below:

Variables	Relative Importance
LOWINCZ	3
PCTSPEZ	1
PCTSABZ	4
PCTPCZ	1
PCTDAZ	2

The group could not reach a consensus on

- a. how much adjustment was enough, but not too much, and
- b. how to coordinate the assignment of assistant principals, helping teachers, and counselors.

The discussion with the APT and others revealed that a great amount of diversity seems to exist from school to school in the roles of persons in these three positions. This creates a problem for developing a formula because a formula depends on a clear understanding of the role of the position and the factors which influence performance in that role. Either someone (or some group) in authority must make these statements or a consensus must exist among the users of the formula. Perhaps the most important finding resulting from the attempt to develop a formula for providing administrative assistance is that the roles of assistant principals, helping teachers, and counselors are not clearly defined or differentiated. Apparently there is great variation across the District in the activities performed by persons in these positions.

Given the difficulty of determining a way to set reasonable limits on the degree of adjustment done by this formula, an alternative approach was taken. The data were updated to reflect the most recent data and an assessment of the special need for administrative assistance was calculated for each school. The results have been provided to the Assistant Superintendent for Elementary Education for possible use along with other information in staffing for 1982-83.

The assessment of special need was based on the formula below.

$$\text{Special Need For Assistance} = (4 * \text{PCTSABZ}) + (3 * \text{LOWINCZ}) + \text{SPEZ} + \text{PCTPCZ}$$



The variables and weights in the formula are identical to those recommended by the APT except that the discipline variable has been removed. Discipline was removed because it was felt to be of a different type from the rest. The discipline at the school is not independent of the school administration as the other variables are. It is not a "given" at the school but is partially a product of the school's rules, procedures, etc. The extent to which schools differ in their potential for discipline problems should be accounted for by the other variables; therefore, to include a measure of the actual level of discipline reports would have the impact of rewarding schools with poor behavior management practices and punishing schools with good management practices.

The formula results are found in Figure D-10. They are labeled "Special Need" and have been rounded to the nearest whole number. The values range from -14 to 8 with a mean of about zero. Therefore, those schools with values greater than zero are above average; i.e., they have greater than average needs. Those with below zero scores, the negative values, are below average in need.

#### Counselors

After the initial teacher formula analyses reported in Attachment D-3 had been done, a series of exploratory analyses were done to allocate counselor positions using the same variables and basic weights. The BASE portion of the formula was as follows:

$$\text{BASE} = \text{Enrollment} / 865.13$$

where 865.13 is the average number of elementary students per counselor in the District.

As with the assistant principal position, the measure to use to limit the adjustment was not readily apparent. The results given in Figures D-11 through D-13 were presented to the APT. These figures provide results for three sets of weights of decreasing size.

The problem of limiting the degree of adjustment is not insurmountable. If a formula were desired, it would simply require that someone make a decision. A more difficult problem, however, is how to tie the assignment of counselors into the assignment of assistant principals and helping teachers. Counselors have traditionally been assigned primarily to Title I schools. This is due partly to the fact that the first elementary counselors were funded by Title I and partly to the need for additional staff positions to ensure Title I comparability. Thus, their assignment appears to have been done somewhat independently of the assignment of assistant principals and helping teachers. It was the view of the Advisory Principals' Team that counselors ought to be assigned as part of the same process that assigns the other two positions. Furthermore, the proposed regulations for Title I's replacement, Chapter 1, would seem to make this more feasible in that they appear to be less rigid. However, a mechanism for linking the allocation of the two positions and for making an equitable adjustment could not be agreed upon.

Variable	Description
AVER	Average of the grade level median ITBS Composite scores.
COMPEN	Number of compensatory programs (Title I, Title I Migrant, SCE, and Title VII Pre-K).
IMPACT	Was the school impacted by desegregation; e.g. paired school or school with major changes in grade span resulting from desegregation? (For example, Travis Heights and Zavala were impacted, Reilly was not).
LOWINC	The percentage of students at the school who received a free or reduced-price lunch. Taken from the 1981-82 Title I Application.
NOSPE	Average number of minutes students were not receiving special education services.
PCTLEP	Percentage of students who are of limited English proficiency.
PCTSPE	Percentage of students served by Special Education.
QUADIF	Student achievement diversity. The average grade equivalent difference between the third and first quartiles for ITBS Composite scores. The mean interquartile range.
TITLE	Whether or not the school had a Title I Program.

Figure D-1. VARIABLES CONSIDERED FOR INCLUSION IN TEACHER STAFFING FORMULA. These data were all taken from the 1980-81 school year.<sup>3</sup>

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Variables Used In Factor Analysis

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## Factor 1:

Educational and Economic Deprivation

Percent Low-Income Students  
Number of Compensatory Education Programs  
Percentage of Students who are LEP  
Does the School Have a Title I Program?

## Factor 2:

Student Diversity

Student Achievement Diversity  
Average Achievement Level  
Was the School Impacted by Desegregation?

## Factor 3:

Special Education

Percentage of Students Served by  
Special Education  
Average Number of Minutes Students  
are Not Receiving Special Education  
Services

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Figure D-2. FACTOR ANALYSIS RESULTS--CLASSROOM TEACHER FORMULA VARIABLES.



Value of Variable WEIGHT	Resulting Weight On . . .			PTR Criterion Exceeded?
	QUADIFZ	LOWINCZ	SPEZ	
1.600	.56000	.4800	.1600	No
2.000	.70000	.6000	.2000	No
5.000	1.75000	1.5000	.5000	Yes
3.000	1.05000	.9000	.3000	Yes
2.500	.87500	.7500	.2500	Yes
2.250	.78750	.6750	.2250	Yes
2.125	.74375	.6375	.2125	Yes
2.100	.73500	.6300	.2100	Yes
2.050	.71750	.6150	.2050	Yes
*2.030	.71050	.6090	.2030	No
2.040	.71400	.6120	.2040	Yes

\*Best solution, largest value of WEIGHT that does not exceed the PTR criterion.

Figure D-3. VALUES OF VARIABLE "WEIGHT" ENTERED INTO THE TEACHER STAFFING FORMULA AND OUTCOME OF PTR CRITERION. The values of WEIGHT are entered in the table from top to bottom in the order in which the analyses were done.

School	Grade Span	Projected Enrollment 1982-83	BASE	+	ADJUSTMENT	=	NUMBER OF TEACHERS	Pupil/Teacher Ratio
Allan	K-3	646	26.531	-	.085	=	26.446*	24.8
Allison	K-3	371	15.605	+	.044	=	15.649	23.2
Andrews	K-6	693	26.904	-	.255	=	26.649	25.7
Barrington	K,4-6	471	17.484	+	.737	=	18.221*	26.2
Barton Hills	K-3	240	10.014	-	.001	=	10.013	24.0
Becker	K-6	633	25.205	+	1.230	=	26.435*	24.3
Blackshear	K,4-6	432	15.789	+	1.030	=	16.819*	25.4
Blayton	K,4-6	487	18.162	+	.603	=	18.765*	25.6
Brentwood	K-3	230	9.517	-	.595	=	8.922*	25.6
Brooke	K,4-6	333	12.380	+	1.590	=	13.970*	23.8
Brown	K-6	562	22.378	+	.318	=	22.696*	24.4
Bryker Woods	K-3	196	8.140	+	.395	=	8.535*	21.8
Campbell	K,4-6	330	12.234	+	1.158	=	13.392*	25.4
Casis	K-3	329	13.591	+	.683	=	14.274	23.5
Cook	K,4-6	689	25.367	+	1.259	=	26.626*	25.5
Cunningham	K,4-6	627	23.211	-	.394	=	22.817	27.3
Dawson	K-6	648	25.660	+	1.037	=	26.697*	24.0
Doss	K-6	538	20.517	-	2.580	=	17.937*	29.9
Govalle	K-3	653	27.416	-	.356	=	27.060	24.2
Graham	K,4-6	291	10.812	-	.120	=	10.692	26.5
Gullett	K,4-6	300	10.987	+	.991	=	11.978*	25.0
Harris	1-6	548	20.942	-	.012	=	20.930	26.1
Highland Park	K-3	346	14.252	-	.067	=	14.185	24.7
Hill	K-4	378	15.239	+	1.886	=	13.353*	29.1
Houston	K-6	1,062	42.023	-	1.689	=	40.334*	26.6
Joslin	K-6	810	30.917	-	1.526	=	29.391*	27.9
Langford	K-6	1,003	39.420	-	1.084	=	38.336*	26.4
Lee	K-6	313	12.325	-	.894	=	11.431*	28.5
Linder	K-6	493	19.675	-	.364	=	19.311*	25.9
Maplewood	K-6	432	16.866	+	.533	=	17.399	25.4
Mathews	K-6	287	11.359	+	.100	=	11.459	26.1
Menchaca	K-6	462	18.300	-	1.509	=	16.791*	27.2
Metz	K-3	420	17.427	-	.316	=	17.111	24.7
Norman	K-3	221	9.115	-	.094	=	9.021	24.6
Oak Hill	K-6	977	39.165	-	4.390	=	34.775*	27.9
Oak Springs	K-3	483	20.234	+	.620	=	20.854*	23.0
Odom	K-6	869	33.775	-	1.310	=	32.465*	27.2
Ortega	K,4-6	213	7.968	+	1.258	=	9.226*	23.7
Pease	1-6	205	7.719	-	.640	=	7.079*	29.3
Pecan Springs	K-3	307	12.815	-	.169	=	12.646	23.6
Pillow	K-3	314	13.231	-	1.543	=	11.688*	26.2
Pleasant Hill	K-6	581	22.642	-	.968	=	21.674*	26.4
Read	5-6	409	14.607	+	.743	=	15.350	27.3
Reilly	K-6	313	12.332	+	.222	=	12.554*	24.1

\*Indicates a school where the NUMBER OF TEACHERS value rounded to the nearest whole number is different from the rounded BASE number.

Figure D-4. THE RESULTS OF APPLYING THE TEACHER ALLOCATION FORMULA.  
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School	Grade Span	Projected Enrollment 1982-83	BASE	+	ADJUSTMENT	=	NUMBER OF TEACHERS	Pupil/Teacher Ratio
Ridgetop	K-6	222	8.579	+	.067	=	8.646	24.7
Rosedale	K, 4-6	211	7.808	+	.539	=	8.347	26.4
Rosewood	1-3	141	5.850	-	.074	=	5.776	23.5
St. Elmo	K-6	539	21.038	-	.347	=	20.692	25.7
Sanchez	K-3	355	14.843	+	.433	=	15.276	23.7
Sims	K-3	225	9.444	+	.189	=	9.633*	22.5
Summitt	K-3	271	11.374	-	1.294	=	10.080*	27.1
Sunset Valley	K-3	649	26.962	-	.688	=	26.274*	25.0
Travis Heights	K-6	708	27.858	-	.424	=	27.434*	26.2
Walnut Creek	K, 4-6	245	9.023	+	.384	=	9.407	27.2
Webb	4-6	729	26.036	+	.910	=	26.946*	27.0
Williams	K-6	905	35.026	-	3.329	=	31.697*	28.3
Winn	K-4	554	22.131	+	.017	=	22.148	25.2
Wooldridge	K, 4-6	498	18.399	+	1.254	=	19.653*	24.9
Wooten	K-3	379	15.773	+	.149	=	15.922	23.7
Zavala	K, 4-6	316	11.909	+	1.786	=	13.695*	22.6
Zilker	K-6	442	17.428	-	.095	=	17.333	26.0

\*Indicates a school where the NUMBER OF TEACHERS value rounded to the nearest whole number is different from the rounded BASE number.

Figure D-4. THE RESULTS OF APPLYING THE TEACHER ALLOCATION FORMULA.  
(Page 2 of 2)

81.42

Type of School	N	BASE PTR		Adjusted PTR	
		Mean	Standard Deviation	Mean	Standard Deviation
K, 4-6					
4-6	24	25.553	0.437	26.419	1.601
5-6					
K, 1-3					
K-3	21	24.148	0.631	24.452	1.617
K-4					
K-6	16	27.193	0.522	25.601	1.389
All	61	25.499	1.296	25.527	1.750

Figure D-5. COMPARISONS OF PTR BASED ON ENROLLMENT ONLY (BASE PTR) AND THE PTR RESULTING FROM THE FORMULA (ADJUSTED PTR) BY TYPE OF SCHOOL. The BASE PTR is equal to the projected enrollment divided by BASE rounded to the nearest whole teacher. The Adjusted PTR is equal to the projected enrollment divided by the formula assigned number rounded to the nearest whole teacher.

Variable	Description
AVER	Average of the grade level median ITBS Composite scores.
COMPEN	Number of compensatory programs (Title I, Title I Migrant, SCE, and Title VII Pre-K).
IMPACT	Was the school impacted by desegregation; e.g. paired school or school with major changes in grade span resulting from desegregation? For example, Travis Heights and Zavala were impacted, Reilly was not.
LOWINC	The percentage of students at the school who received a free or reduced-price lunch. Taken from the 1981-82 Title I Application.
NOSPE	Average number of minutes students were not receiving special education services.
PCTLEP	Percentage of students who were of limited English proficiency (LEP).
PCTPC	Percentage of the schools' classrooms housed in portable buildings.
PCTSAB	Percentage of students who arrive by bus.
PCTSPE	Percentage of students served by Special Education.
PCTSPT	Percentage of the teachers who teach in compensatory education programs.
PCTSSC	Percentage of the students who are in Special Education self-contained classrooms.
QUADIF	Student achievement diversity. The average grade equivalent difference between third and first quartiles for ITBS Composite scores. The median interquartile range.
TITLE	Whether or not the school had a Title I Program.

Figure D-6. VARIABLES CONSIDERED FOR INCLUSION IN ASSISTANT PRINCIPAL AND HELPING TEACHER FORMULA. These data were all taken from the 1980-81 school year.

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### Variables Used In Factor Analysis

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Factor 1:	<u>Economic and Educational Deprivation</u>
	Percent Low Income
	Percentage of Teachers who Teach in Compensatory Education Programs
	Number of Compensatory Education Programs
	Percentage of Students who are LEP
	Does the School Have a Title I Program?
Factor 2:	<u>Special Education</u>
	Percentage of Students Served by Special Education
	Average Number of Minutes Students are not Receiving Special Education Services
	Student Achievement Diversity
Factor 3:	<u>Desegregation</u>
	Percentage of the Students Arriving by Bus
	Was the School Impacted by Desegregation?
Factor 4:	<u>Achievement</u>
	Average Achievement Level
Variables not Included in any Factor	
	Percentage of Classrooms Housed in Portable Buildings
	Percentage of Students in Special Education Self-Contained Classrooms

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Figure D-7. FACTOR ANALYSIS RESULTS - ASSISTANT PRINCIPAL AND HELPING TEACHER VARIABLES.

Weight	Variable	Relative Importance
W1	Percent Low Income	3
W2	Percent Special Education	1.5
W3	Percent Bused	2
W4	Average Achievement	1
W5	Percent of Classes in Portables	1
W6	Percent in Self-Contained Special Ed. Classes	1.5

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Figure D-8. RELATIVE IMPORTANCE ASSIGNED TO VARIABLES USED IN FORMULA.

Figure D-9

EFFECT OF VARYING DEGREES OF ADJUSTMENT ON THE RANK ORDERING OF SCHOOLS.

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RANK	BY ENROLLMENT	BY THE FORMULA WITH WEIGHTS SET AT THESE PERCENTAGES OF THE ORIGINAL...					
		.02	.04	.05	.067	.073	.10
1	HOUSTON	WEBB	WEBB	WEBB	WEBB	WEBB	WEBB
2	ODOM	HOUSTON	DAWSON	DAWSON	DAWSON	DAWSON	CASIS
3	WILLIAMS	ODOM	HOUSTON	CASIS	CASIS	CASIS	DAWSON
4	WEBB	DAWSON	BECKER	BECKER	BECKER	BECKER	BECKER
5	LANGFORD	LANGFORD	CASIS	LANGFORD	TRAVIS HEIGHTS	ALLAN	ALLAN
6	OAK HILL	WILLIAMS	LANGFORD	HOUSTON	ALLAN	TRAVIS HEIGHTS	OAK SPRINGS
7	JOSLIN	JOSLIN	JOSLIN	TRAVIS HEIGHTS	COOK	COOK	BLACKSHEAR
8	CUNNINGHAM	BECKER	TRAVIS HEIGHTS	COOK	OAK SPRINGS	OAK SPRINGS	TRAVIS HEIGHTS
9	GOVALLE	COOK	COOK	JOSLIN	LANGFORD	LANGFORD	COOK
10	DAWSON	TRAVIS HEIGHTS	ODOM	ALLAN	JOSLIN	BLACKSHEAR	CAMPBELL
11	ST. ELMO	OAK HILL	ALLAN	OAK SPRINGS	BLACKSHEAR	JOSLIN	LANGFORD
12	ANDREWS	GOVALLE	OAK SPRINGS	ODOM	HOUSTON	CAMPBELL	ZAVALA
13	BECKER	ST. ELMO	GOVALLE	BLACKSHEAR	CAMPBELL	ZAVALA	WOOLDRIDGE
14	COOK	CUNNINGHAM	ST. ELMO	GOVALLE	WOOLDRIDGE	WOOLDRIDGE	JOSLIN
15	TRAVIS HEIGHTS	ALLAN	WOOLDRIDGE	WOOLDRIDGE	ZAVALA	HOUSTON	BARRINGTON
16	ROSS	ANDREWS	BLACKSHEAR	CAMPBELL	BLANTON	BLANTON	BLANTON
17	PLEASANT HILL	HARRIS	WILLIAMS	ST. ELMO	BARRINGTON	BARRINGTON	ORTEGA
18	WINN	WINN	CAMPBELL	BLANTON	GOVALLE	GOVALLE	BROOKE
19	HARRIS	OAK SPRINGS	HARRIS	ZAVALA	ODOM	HARRIS	MATHEWS
20	LINDER	CASIS	BLANTON	BARRINGTON	ST. ELMO	ORTEGA	HARRIS*
21	ALLAN	WOOLDRIDGE	CUNNINGHAM*	HARRIS*	HARRIS*	ST. ELMO*	GOVALLE*
22	WOOLDRIDGE	ZAVALA	WINN*	ANDREWS*	WINN*	ODOM*	ST. ELMO*
23	BLANTON	CAMPBELL	WINN*	ANDREWS*	WINN*	BROOKE	HOUSTON*
24	OAK SPRINGS	BLACKSHEAR	ANDREWS*	OAK HILL*	CUNNINGHAM*	WINN*	WINN*
25	ZILKER	ANDREWS*	OAK HILL*	CUNNINGHAM*	ANDREWS*	MATHEWS	HOUSTON*
26	SUNSET VALLEY	PLEASANT HILL*	ANDREWS*	OAK HILL*	CUNNINGHAM*	ANDREWS*	WINN*
27	BARRINGTON					CUNNINGHAM*	
28	CAMPBELL					ANDREWS*	



RANK	BY ENROLLMENT	BY THE FORMULA WITH WEIGHTS SET AT THESE PERCENTAGES OF THE ORIGINAL...					
		.02	.04	.05	.067	.073	.10
29	BROWN						CUNNINGHAM*
30	MENCHACA						ANDREWS*
31	ZAVALA				OAK HILL		ODOM*
32	BLACKSHEAR						
33	METZ					OAK HILL*	
34	WOOTEN		PLEASANT HILL*		WILLIAMS*		
35	BROOKE						
36	READ						
37	CASIS			PLEASANT HILL*		WILLIAMS*	
38	ALLISON						
39	MAPLEWOOD						
40	SANCHEZ						
41	HILL						OAK HILL*
42	MATHEWS						
43	GULLETT						
44	PILLOW				PLEASANT HILL*		WILLIAMS*
45	HIGHLAND PARK					PLEASANT HILL*	
46	PECAN SPRINGS						PLEASANT HILL*
47	REILLY						
48	ORTEGA						
49	GRAHAM						
50	LEE						
51	WALNUT CREEK						
52	PEASE						
53	SIMS						
54	RIDGETOP						
55	BARTON HILL		DOSS*				
56	NORMAN			DOSS*			
57	BRENTWOOD				DOSS*		

DOSS\*

PLEASANT HILL\*

PLEASANT HILL\*

PLEASANT HILL\*

DOSS\*

DOSS\*

DOSS\*

RANK	BY ENROLLMENT	BY THE FORMULA WITH WEIGHTS SET AT THESE PERCENTAGES OF THE ORIGINAL...					
		.02	.04	.05	.067	.073	.10
58	ROSEDALE					DOSS*	
59	BRYKER WOODS						
60	SUMMIT						DOSS*
61	ROSEWOOD						

\*Indicates a school originally in the top 19 in rank.

Figure D-9. EFFECT OF VARYING DEGREES OF ADJUSTMENT ON THE RANK ORDERING OF SCHOOLS.

School	Staff in 1981-82			Percentages Used in Calculating z-scores				Enrollment	Special Need
	Assistant Principal	Helping Teacher	Counselor	Low Income	Special Education	Portable Classrooms	Students Bussed		
Houston	1	0	1	.391	.073	.360	.003	1,062	-6
Langford	1	0	1	.433	.081	.130	.360	1,003	-1
Oak Hill	1	0	0	.075	.061	.170	.806	977	0
Williams	1	0	1	.143	.070	.230	.181	905	-8
Odum	1	0	1	.328	.096	.310	.000	869	-7
Joslin	1	0	1	.340	.085	.350	.447	810	0
Webb	1	0	1	.395	.091	.000	.868	729	5
Travis Heights	0	1	1	.459	.101	.320	.383	708	1
Andrews	0	0	1	.511	.099	.130	.258	693	-1
Cook	1	0	1	.479	.104	.300	.339	689	1
Govalle	1	0	1	.657	.074	.000	.407	653	2
Sunset Valley	0	0	1/2	.440	.117	.300	.537	649	-4
Dawson	1	0	1	.698	.189	.320	.000	648	2
Allan	1	0	1	.571	.093	.000	.602	646	4
Becker	0	1	1	.865	.127	.200	.000	633	2
Cunningham	1	0	0	.270	.112	.180	.242	627	-4
Pleasant Hill	0	0	1	.329	.119	.530	.207	581	-1
Brown	0	0	1	.603	.139	.070	.130	562	-1
Winn	0	1	1	.579	.084	.070	.552	554	3
Harris	0	0	1	.486	.108	.140	.214	548	-2
St. Elmo	1	0	0	.394	.154	.220	.000	539	-5
Doss	0	0	0	.113	.063	.000	.045	538	-14
Wooldridge	0	1	0	.10	.140	.000	.255	498	-1
Linder	0	1	1	.439	.089	.230	.216	493	-2
Blanton	0	0	1/2	.485	.139	.000	.364	487	0
Oak Springs	0	1	1	.735	.159	.130	.488	483	7
Barrington	0	0	0	.471	.120	.240	.658	471	6
Manchaca	0	0	0	.117	.087	.170	.972	462	3
Zilker	0	0	1	.483	.131	.300	.014	442	-3
Blackshear	0	0	1	.550	.136	.000	.499	432	3
Maplewood	0	0	1/2	.664	.126	.340	.000	432	0
Metz	0	0	1	.629	.061	.100	.471	420	3
Read	0	1	0	.317	.079	.080	.876	409	4
Wooten	0	0	1/2	.519	.201	.000	.190	379	-1
Hill	0	0	0	.053	.081	.000	.113	378	-12
Allison	0	0	1/2	.837	.115	.000	.000	371	-1
Sanchez	0	0	1/2	.666	.098	.000	.387	355	2
Highland Park	0	0	0	.486	.103	.000	.514	346	1
Brooke	0	0	1	.585	.137	.040	.398	333	2
Campbell	0	1	1	.714	.095	.070	.562	330	6
Casis	0	0	0	.585	.133	.050	.601	329	5
Zavala	0	0	1	.606	.142	.310	.547	316	7
Pillow	0	0	0	.134	.089	.000	.446	314	-5
Lee	0	0	0	.248	.101	.130	.007	313	-9
Reilly	0	0	0	.487	.160	.000	.007	313	-5
Pecan Springs	0	0	1/2	.565	.131	.000	.086	307	-3
Gullett	0	0	0	.427	.156	.080	.420	300	1
Graham	0	0	0	.369	.074	.000	.390	291	-3
Mathews	0	0	0	.576	.115	.000	.484	287	3
Summitt	0	0	0	.124	.034	.290	.938	271	3
Walnut Creek	0	0	1/2	.598	.124	.000	.446	245	3
Barton Hills	0	0	0	.502	.149	.140	.569	240	5
Brentwood	0	0	0	.362	.095	.000	.000	230	-8
Sims	0	0	1/2	.640	.150	.000	.405	225	3
Ridgetop	0	0	1/2	.664	.084	.000	.000	222	-4
Norman	0	0	1/2	.647	.108	.130	.711	221	8
Ortega	0	0	0	.579	.250	.000	.445	213	5
Rosedale	0	0	1/2	.637	.211	.000	.336	211	4
Pease	0	0	0	.223	.044	.000	.009	205	-12
Bryker Woods	0	0	0	.527	.140	.190	.494	196	4
Rosewood	0	0	1/2	.752	.046	.000	.731	141	7

Figure D-10. SPECIAL NEED FOR ADMINISTRATIVE ASSISTANCE AND PERCENTAGES USED IN CALCULATIONS. Schools are ranked by projected 1982-83 enrollment. Under "Staff in 1981-82," a one indicates a full-time position; a 1/2 indicates a half-time position.

School	Enrollment	Number of Counselors	= Base + Adjustment	
Dawson	660	1.45405	.76289	.69116
Becker	639	1.19338	.73862	.45476
Ortega	326	1.03351	.37682	.65669
Maplewood	400	1.01548	.46236	.55312
Wooten	443	.98044	.51206	.46838
Oak Springs	520	.95291	.60107	.35185
Harris	595	.93593	.68776	.24817
Brown	483	.92149	.55830	.36320
St. Elmo	657	.91613	.75942	.15671
Travis Heights	627	.88209	.72475	.15734
Houston	928	.88168	1.07267	-.19099
Rosedale	244	.87561	.28204	.59357
Reilly	327	.86875	.37798	.49077
Odom	868	.84552	1.00332	-.15780
Zavala	475	.83415	.54905	.28510
Allan	564	.82734	.65193	.17541
Woodbridge	544	.81820	.62881	.18940
Langford	745	.80415	.86114	-.05699
Webb	746	.80093	.86230	-.06137
Cook	632	.78282	.73053	.05230
Blackshear	452	.77938	.52246	.25692
Casis	406	.76440	.46929	.29511
Govalle	670	.74362	.77445	-.03083
Brooke	419	.73185	.48432	.24753
Linder	588	.72950	.67967	.04983
Campbell	492	.71934	.56870	.15064
Allison	405	.71123	.46814	.24310
Blanton	521	.70383	.60222	.10161
Winn	598	.68859	.69123	-.00264
Andrews	647	.68382	.74786	-.06405
Mathews	385	.67946	.44502	.23444
Pecan Springs	340	.67842	.39300	.28541
Zilker	506	.65062	.58488	.06573
Sanchez	397	.61301	.45889	.15412
Joslin	731	.61001	.84496	-.23495
Sunset Valley	506	.59207	.58488	.00718
Gullett	384	.53816	.44386	.09429
Barrington	496	.52350	.57332	-.04983
Ridgetop	274	.50085	.31672	.18414
Sims	277	.48155	.32018	.16136
Rosewood	141	.47189	.16298	.30891
Bryker Woods	238	.46421	.27510	.18910
Cunningham	671	.44511	.77561	-.33049
Walnut Creek	291	.43760	.33637	.10124
Norman	257	.43055	.29707	.13348
Pleasant Hill	599	.41848	.69238	-.27390
Metz	446	.40770	.51553	-.10783
Williams	853	.35569	.98598	-.63029
Barton Hills	262	.28913	.30284	-.01372
Highland Park	366	.27389	.42306	-.14917
Read	418	.19578	.48316	-.28738
Brentwood	254	.14395	.29360	-.14965
Graham	320	.06460	.36989	-.30528
Lee	301	-.08675	.34792	-.43468
Menchaca	481	-.10163	.55599	-.65762
Oak Hill	737	-.11996	.85190	-.97186
Pease	284	-.14744	.32827	-.47571
Pillow	370	-.25451	.42768	-.68219
Doss	605	-.30612	.69932	-1.00544
Hill	386	-.42755	.44618	-.87372
Summit	218	-.75368	.25199	-1.00566

Figure D-11. NUMBER OF COUNSELORS ASSIGNED BY THE ORIGINAL TEACHER FORMULA WITH WEIGHTS OF .26334, .08778, AND .17556 FOR PERCENT LOW INCOME, ACHIEVEMENT DIVERSITY, AND PERCENT SPECIAL EDUCATION RESPECTIVELY.

School	Enrollment	Number of Counselors	= Base + Adjustment
Dawson	660	1.28650	.76289 .52361
Becker	639	1.08314	.73862 .34452
Houston	928	.92798	1.07267 -.14469
Odom	868	.88377	1.00332 -.11955
Maplewood	400	.88139	.46236 .41903
St. Elmo	657	.87814	.75942 .11872
Harris	595	.87577	.68776 .18801
Ortega	326	.87431	.37682 .49749
Oak Springs	520	.86762	.60107 .26655
Wooten	443	.86690	.51206 .35483
Travis Heights	627	.84394	.72475 .11920
Brown	483	.83345	.55830 .27515
Langford	745	.81797	.86114 -.04318
Webb	746	.81580	.86230 -.04649
Allan	564	.78481	.65193 .13289
Wooldridge	544	.77229	.62881 .14348
Cook	632	.77014	.73053 .03962
Zavala	475	.76504	.54905 .21598
Govalla	670	.75110	.77445 -.02335
Reilly	327	.74977	.37798 .37180
Rosedale	244	.73171	.28204 .44968
Linder	588	.71742	.67967 .03775
Blackshear	452	.71710	.52246 .19463
Andrews	647	.69935	.74786 -.04852
Casis	406	.69286	.46929 .22356
Winn	598	.68923	.69123 -.00200
Campbell	492	.68282	.56870 .11412
Blanton	521	.67920	.60222 .07698
Brooke	419	.67185	.48432 .18753
Joslin	731	.66697	.84496 -.17799
Allison	405	.65230	.46814 .18416
Zilker	506	.63468	.58488 .04980
Mathews	385	.62263	.44502 .17761
Pecan Springs	340	.60923	.39300 .21622
Sunset Valley	506	.59032	.58488 .00544
Sanchez	397	.57565	.45889 .11676
Barrington	496	.53558	.57332 -.03775
Cunningham	671	.52523	.77561 -.25037
Gullet	384	.51530	.44386 .07144
Williams	853	.50849	.98598 -.47749
Pleasant Hill	599	.48488	.69238 -.20750
Ridgetop	274	.45621	.31672 .13950
Sims	277	.44243	.32018 .12224
Metz	446	.43384	.51553 -.08169
Bryker Woods	238	.41836	.27510 .14326
Walnut Creek	291	.41306	.33637 .07669
Norman	257	.39819	.29707 .10112
Rosewood	141	.39700	.16298 .23402
Highland Park	366	.31005	.42306 -.11301
Barton Hills	262	.29245	.30284 -.01039
Read	418	.26545	.48316 -.21771
Brentwood	254	.18023	.29360 -.11337
Graham	320	.13861	.36989 -.23127
Oak Hill	737	.11564	.85190 -.73625
Menchaca	481	.05779	.55599 -.49820
Lee	301	.01862	.34792 -.32930
Pease	284	-.03211	.32827 -.36039
Doss	605	-.06238	.69932 -.76169
Pillow	370	-.08913	.42768 -.51681
Hill	386	-.21574	.44618 -.66191
Summit	218	-.50988	.25199 -.76186

Figure D-12. NUMBER OF COUNSELORS ASSIGNED BY THE ORIGINAL TEACHER FORMULA WITH WEIGHTS OF .1995, .0665, AND .133 FOR PERCENT LOW INCOME, ACHIEVEMENT DIVERSITY, AND PERCENT SPECIAL EDUCATION RESPECTIVELY.

School	Enrollment	Number of Counselors	= $\frac{E}{B}$ + Adjustment	
Dawson	660	1.11205	.76289	.34916
Houston	928	.97618	1.07267	-.09649
Becker	639	.96833	.73862	.22971
Odum	868	.92359	1.00332	-.07972
St. Elmo	657	.83859	.75942	.07917
Langford	745	.83232	.86114	-.02882
Webb	746	.83131	.86230	-.03099
Harris	595	.81306	.68776	.12530
Travis Heights	627	.80419	.72475	.07945
Oak Springs	520	.77876	.60107	.17770
Govalla	670	.75884	.77445	-.01561
Cook	632	.75695	.73053	.02642
Wooten	443	.74869	.51206	.23663
Brown	483	.74176	.55830	.18346
Maplewood	400	.74171	.46236	.27935
Allan	564	.74050	.65193	.08858
Joslin	731	.72631	.84496	-.11865
Wooldridge	544	.72450	.62881	.09570
Andrews	647	.71548	.74786	-.03238
Ortega	326	.70852	.37682	.33170
Linder	588	.70477	.67967	.02511
Zavala	475	.69298	.54905	.14393
Winn	598	.68984	.69123	-.00138
Williams	853	.66767	.98598	-.31830
Blanton	521	.65361	.60222	.05139
Blackshear	452	.65227	.52246	.12980
Campbell	492	.64477	.56870	.07607
Reilly	327	.62583	.37798	.24785
Casis	406	.61827	.46929	.14898
Zilker	506	.61808	.58488	.03320
Brooke	419	.60930	.48432	.12497
Cunningham	671	.60873	.77561	-.16687
Allison	405	.59094	.46814	.12280
Sunset Valley	506	.58852	.58488	.00363
Rosedale	244	.58195	.28204	.29992
Mathews	385	.56338	.44502	.11836
Pleasant Hill	599	.55406	.69238	-.13832
Barrington	496	.54819	.57332	-.02514
Pecan Springs	340	.53719	.39300	.14419
Sanchez	397	.53668	.45889	.07778
Gullett	384	.49149	.44386	.04763
Metz	446	.46102	.51553	-.05451
Ridgetop	274	.40969	.31672	.09298
Sims	277	.40166	.32018	.08148
Walnut Creek	291	.38755	.33637	.05119
Bryker Woods	238	.37052	.27510	.09542
Norman	257	.36449	.29707	.06743
Oak Hill	737	.36108	.85190	-.49081
Highland Park	366	.34768	.42306	-.07537
Read	418	.33798	.48316	-.14519
Rosewood	141	.31903	.16298	.15604
Barton Hills	262	.29592	.30284	-.00693
Menchaca	481	.22383	.55599	-.33215
Brentwood	254	.21803	.29360	-.07556
Graham	320	.21573	.36989	-.15416
Doss	605	.19153	.69932	-.50779
Lee	301	.12844	.34792	-.21948
Pease	284	.08797	.32827	-.24031
Pillow	370	.08316	.42768	-.34452
Hill	386	.00489	.44618	-.44128
Summit	218	-.25598	.25199	-.50797

Figure D-13. NUMBER OF COUNSELORS ASSIGNED BY THE ORIGINAL TEACHER FORMULA WITH WEIGHTS OF .133, .0443, AND .0887 FOR PERCENT LOW INCOME, ACHIEVEMENT DIVERSITY, AND PERCENT SPECIAL EDUCATION RESPECTIVELY.

1 PERMANENT FILE A954 LISTED 12.57.45. 06 JUN 82  
 LOADED 02.58.59. 03 JUN 82  
 (UNMODIFIED) DUMPED 03.00.39. 03 JUN 82

SECTORS ALLOCATED = 1000 SECTORS USED = 776  
 NUMBER OF FILES = 65 SECTORS LEFT = 224

FILE NAME	VERSION	SECTORS	TIME	DATE	COMMENTS
COUNSEL	2	6	14.10.57.	01 MAR 82	DATA ON COUNSELORS IN ELEMENTARY SCHOOLS
ELEMAD1	3	2	16.05.51.	02 FEB 82	DATA ON ELEMENTARY SCHOOL CHARACTERISTICS (ASST PRINCIPAL)
ELEMAD1	4	5	09.21.42.	06 MAR 82	FINAL SET OF DATA FOR ELEMENTARY TEACHER STAFFING
ELEMAD2	1	6	13.24.19.	06 MAR 82	ELEMAD1 WITH NEW VARIABLES CREATED
ELEMAD3	1	8	14.14.35.	06 MAR 82	ELEMAD2 WITH Z-SCORES FOR FORMULA VARIABLES ADDED
ELEMAD4	2	6	10.15.41.	16 APR 82	ELEMENTARY DATA FOR COMPUTING NEED FOR ADMIN. ASSISTANCE
LASTCON	2	2	13.09.17.	06 MAR 82	CONTROL CARDS FOR ELEMAD1
LASTC01	3	2	14.12.23.	06 MAR 82	CONTROL CARDS FOR ELEMAD2
LASTC02	4	2	11.36.12.	29 MAR 82	CONTROL CARDS FOR SETTING THE ELEMEN TEACHER WEIGHTS
LASTC03	9	3	14.15.11.	29 MAR 82	CONTROL CARDS FOR GETTING DESCRIPTIVE INFO.
LASTC04	5	2	15.25.02.	16 APR 82	CONTROL CARDS FOR COMPUTING SPECIAL NEED FOR ADMIN. ASSISTANCE
NEWSTAF	2	21	15.41.58.	03 DEC 81	THE FILE NAMED SORTED WITH NEW VARIABLES ADDED
SORTED	2	26	20.45.56.	17 NOV 81	FILE STAFF SORTED BY SCHOOL
STAFCON	8	11	15.15.12.	03 DEC 81	SPSS CONTROL FILE FOR SORTED
STAF02	8	14	16.43.13.	08 DEC 81	SPSS CONTROL FILE FOR NEWSTAF
STAF03	7	9	08.36.24.	10 DEC 81	SPSS CONTROL FOR NEWSTAF--FACTOR ANALYSES
STAF04	11	8	10.41.12.	27 JAN 82	SPSS CONTROL FILE FOR STAFF4
STAF06	4	9	14.02.45.	22 FEB 82	SPSS CONTROL FOR STAFF6--FACTOR ANALYSES
STAF07	10	9	11.01.16.	26 FEB 82	SPSS CONTROL FOR STAFF5 (ASST PRINCIPALS)
STAF09	5	8	14.03.03.	04 MAR 82	SPSS CONTROL FOR STAFF6 (COUNSELORS)
STAFF	1	26	15.30.21.	13 NOV 81	FILE OF STAFFING DATA BY SCHOOL: CARD 3 OUT OF PLACE
STAFF3	1	20	11.00.31.	07 DEC 81	FILE NEWSTAF WITH ALLISON AND BECKER REMOVED
STAFF4	1	21	11.49.00.	10 DEC 81	FILE NEWSTAF WITH Z-SCORES ADDED
STAFF5	2	23	13.58.04.	15 FEB 82	FILE STAFF4 WITH DATA ON SCHOOL CHARACTERISTICS
STAFF6	1	22	14.13.20.	01 MAR 82	FILE STAFF4 WITH DATA ON COUNSELORS

\* = MODIFIED FILE

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UT Permanent Files Used In Formula Development

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Attachment D-1

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Attachment D-2

FACTOR ANALYSIS RESULTS FOR TEACHER FORMULA DEVELOPMENT

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COMPUTATION CENTER  
UNIVERSITY OF TEXAS AT AUSTIN

81.42

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

CDC 6032/CYBER 7C VERSION 8.0 - INSTALLED 27 AUGUST 80

PAGESIZE EJECT  
RJN NAME RECORDING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
VARIABLE LIST SCHOOL1 ENROL1 TO ENROL6 TITLE HIG SCE LEP LOWINC ATTEND IMPACT  
NUMFK NUMF1 TO NUMF6 NUMTK NUMT1 TO NUMT6 SCHOOL2 NUMT5 NUMT6  
NUMPREK NUMTEACH TYPREK LIBRAR MUSIC PE ART SPE NUMSPE NOSPE  
FIRST1 TO FIRST3 SEC1 TO SEC3 THP01 TO THP03 FOUR1 TO  
FOUR3 FIVE1 FIVE2 SCHOOL3 FIVE3 SIX1 TO SIX3 TYPE QUADIF CHANGE  
AVER ENROLZ LOWINCZ, SPEZ, QUADIFZ  
INPUT MEDIUM DISK  
INPUT FORMAT (3X,F3,6F4,3F1,F3,2F2,F1,12F3/3X,4F3,F2,F1,4F3,2,F1,2F3,14F3,2/  
3X,F3,3F1,2,F4,2,F1,F4,2,F5,F3,2,4F4,2)

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
SCHOOL1	F 3.0	1	4- 6
ENROL1	F 4.0	1	7- 13
ENROL2	F 4.0	1	11- 14
ENROL3	F 4.0	1	15- 18
ENROL4	F 4.0	1	19- 22
ENROL5	F 4.0	1	23- 26
ENROL6	F 4.0	1	27- 33
TITLE	F 1.0	1	31- 31
HIG	F 1.0	1	32- 32
SCE	F 1.0	1	33- 33
LEP	F 3.0	1	34- 36
LOWINC	F 2.0	1	37- 39
ATTEND	F 2.0	1	39- 40
IMPACT	F 1.0	1	41- 41
NUMFK	F 3.0	1	42- 44

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ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE FORMAT RECORD COLUMNS

NUMF1	F 3. 0	1	45- 47
NUMF2	F 3. 0	1	48- 51
NUMF3	F 3. 0	1	51- 53
NUMF4	F 3. 0	1	54- 56
NUMF5	F 3. 0	1	57- 59
NUMF6	F 3. 0	1	61- 62
NUMTK	F 3. 0	1	63- 65
NUMT1	F 3. 0	1	66- 69
NUMT2	F 3. 0	1	69- 71
NUMT3	F 3. 0	1	72- 74
NUMT4	F 3. 0	1	75- 77
SCHOOL2	F 3. 0	2	4- 6
NUMT5	F 3. 0	2	7- 9
NUMT6	F 3. 0	2	10- 12
NUMPREK	F 3. 0	2	13- 15
NUMTEACH	F 2. 0	2	16- 17
T7PREK	F 1. 0	2	18- 19
LIBRAP	F 3. 2	2	19- 21
MUSIC	F 3. 2	2	22- 24
PE	F 3. 2	2	25- 27
ART	F 3. 2	2	28- 30
SPE	F 1. 0	2	31- 31
NUMSPE	F 3. 0	2	32- 34
NOSPE	F 3. 0	2	35- 37
FIRST1	F 3. 2	2	38- 40
FIRST2	F 3. 2	2	41- 43
FIRST3	F 3. 2	2	44- 46
SEC1	F 3. 2	2	47- 49
SEC2	F 3. 2	2	51- 52
SEC3	F 3. 2	2	53- 55
THIRD1	F 3. 2	2	56- 58
THIRD2	F 3. 2	2	59- 61
THIRD3	F 3. 2	2	62- 64
FOUR1	F 3. 2	2	65- 67
FOUR2	F 3. 2	2	68- 70
FOUR3	F 3. 2	2	71- 73
FIVE1	F 3. 2	2	74- 76
FIVE2	F 3. 2	2	77- 79
SCHOOL3	F 3. 0	3	4- 6
FIVE3	F 3. 2	3	7- 9
SIX1	F 3. 2	3	10- 12
SIX2	F 3. 2	3	13- 15
SIX3	F 4. 2	3	16- 19
TYPE	F 1. 0	3	21- 23
QUADIF	F 4. 2	3	21- 24
CHANGE	F 5. 0	3	25- 29

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ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE FORMAT RECORD COLUMNS

AVER	F 3. 2	3	32- 32
ENROL2	F 4. 2	3	33- 36
LOWINCZ	F 4. 2	3	37- 40
SPEZ	F 4. 2	3	41- 44
QUADIFZ	F 4. 2	3	45- 48

THE INPUT FORMAT PROVIDES FOR 66 VARIABLES. 66 WILL BE READ.

IT PROVIDES FOR 3 RECORDS (CARDS) PER CASE.

A MAXIMUM OF 79 COLUMNS ARE USED ON A RECORD.

MISSING VALUES ALL (BLANK)

VAR LABELS

ENROL1, FIRST SIX WEEKS ENROLLMENT/  
 ENROL2, SECOND SIX WEEKS ENROLLMENT/  
 ENROL3, THIRD SIX WEEKS ENROLLMENT/  
 ENROL4, FOURTH SIX WEEKS ENROLLMENT/  
 ENROL5, FIFTH SIX WEEKS ENROLLMENT/  
 ENROL6, SIXTH SIX WEEKS ENROLLMENT/  
 TITLE, TITLE I PROGRAM ?/  
 MIG, MIGRANT PROGRAM ?/  
 SCE, SCE PROGRAM ?/  
 LEP, NUMBER OF LEP STUDENTS/  
 LOWINC, PERCENT LOW INCOME/  
 ATTEND, PERCENT ATTENDANCE FOR 80-81/  
 IMPACT, IMPACTED BY DESEGREGATION?  
 NUMFK, ENROLLMENT FIRST SIX WEEKS KINDERGARTEN/  
 NUMF1, ENROLLMENT FIRST SIX WEEKS FIRST GRADE/  
 NUMF2, ENROLLMENT FIRST SIX WEEKS 2ND GRADE/  
 NUMF3, ENROLLMENT FIRST SIX WEEKS 3RD GRADE/  
 NUMF4, ENROLLMENT FIRST SIX WEEKS 4TH GRADE/  
 NUMF5, ENROLLMENT FIRST SIX WEEKS 5TH GRADE/  
 NUMF6, ENROLLMENT FIRST SIX WEEKS 6TH GRADE/  
 NUMIK, ENROLLMENT THIRD SIX WEEKS KINDERGARTEN/  
 NUMI1, ENROLLMENT THIRD SIX WEEKS 1ST GRADE/  
 NUMI2, ENROLLMENT THIRD SIX WEEKS 2ND GRADE/  
 NUMI3, ENROLLMENT THIRD SIX WEEKS 3RD GRADE/  
 NUMI4, ENROLLMENT THIRD SIX WEEKS 4TH GRADE/  
 NUMI5, ENROLLMENT THIRD SIX WEEKS 5TH GRADE/  
 NUMI6, ENROLLMENT THIRD SIX WEEKS 6TH GRADE/  
 NUMPREK, NUMBER OF PRE-K STUDENTS/  
 NUMTEACH, NUMBER OF CLASSROOM TEACHERS/  
 TYPREK, TITLE VII PRE-K ?/  
 LIBRAR, NUMBER OF LIBRARIANS/  
 MUSIC, NUMBER OF MUSIC TEACHERS/  
 PE, NUMBER OF PE TEACHERS/  
 ART, NUMBER OF ART TEACHERS/  
 SPE, NUMBER OF SPECIAL ED TEACHERS/  
 NUMSPE, NUMBER OF SPECIAL ED STUDENTS/  
 NOSPE, AV # OF MINUTES NOT IN SPE/  
 FIRST1, 1ST GRADE, 1ST QUANTILE/  
 FIRST2, 1ST GRADE, MEDIAN/  
 FIRST3, 1ST GRADE, 3RD QUANTILE/  
 DECI1, 2ND GRADE, 1ST QUANTILE/

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SEC2,2ND GRADE MEDIAN/  
 SEC3,2ND GRADE, 3RD QUARTILE/  
 THIR01,3RD GRADE, 1ST QUARTILE/  
 THIR02,3RD GRADE, MEDIAN/  
 THIR03,3RD GRADE, 3RD QUARTILE/  
 FOUR1,4TH GRADE, 1ST QUARTILE/  
 FOUR2,4TH GRADE, MEDIAN/  
 FOUR3,4TH GRADE, 3RD QUARTILE/  
 FIVE1,5TH GRADE, 1ST QUARTILE/  
 FIVE2,5TH GRADE, MEDIAN/  
 FIVE3,5TH GRADE, 3RD QUARTILE/  
 SIX1,6TH GRADE, 1ST QUARTILE/  
 SIX2,6TH GRADE, MEDIAN/  
 SIX3,6TH GRADE, 3RD QUARTILE/  
 QUADIF,MEAN DIFF BETWEEN 3RD & 1ST QUARTILES/  
 CHANGE,DIFF IN 1ST AND 3RD SIX WKS ENROLLMENT/  
 TYPE, GRADE SPAN 1=K-6,2=K-3,K-4,3=4-5,5-6/  
 AVER,AVERAGE OF MEDIAN TEST SCORES/  
 COMPEN=TITLE + MIG + SCE + TYPPEK  
 PCILEP=LEP/ENROLL  
 PCTSPE=VUMSPE/ENPOL1  
 LIBRAR TO ART FIRST1 TO SIX3 QUADIF AVE3 PCTSPE PCTLEP (2)  
 FACTOR ANALYSIS --ALL SCHOOLS  
 VARIABLES=TITLE LOWINC IMPACT NOSPE QUADIF AVER  
 COMPEN PCTLEP PCTSPE  
 TYPE=PA2/ROTATE=OBLIQUE/DELTA=-1,.5,.5/  
 1,2,3,4,5,6  
 READ INPUT DATA

COMPUTE  
 COMPUTE  
 COMPUTE  
 PRINT FORMATS  
 TASK NAME  
 FACTOR

STATISTICS

10053100 CM NEEDED FOR FACTOR

END OF FILE IN FILE STAFF4  
 AFTER READING 61 CASES FROM SUBFILE N0NAME

READING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS --ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26 JAN 32)

25 JAN 87 17.38.48. PAGE

VARIABLE	MEAN	STANDARD DEV	CASES
TITLE	.3938	.4726	61
LOWINC	54.5738	23.7135	61
IMPACT	.5216	.5135	61
NOSPE	265.3334	47.3945	61
QUADIF	1.7372	.4512	61
AVER	4.4534	1.2397	61
COMPEN	.7544	.8538	61
PCTLEP	.1663	.1716	61
PCTSEE	.2938	.1325	61

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CORRELATION COEFFICIENTS..

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	TITLE	LOWINC	IMPACT	NOSPE	QUADIF	AVER	COMPEN	PCTLEP	PCTSPF
TITLE	1.00000	.68319	.15193	-.20337	.04175	-.20531	.37941	.34997	.15526
LOWINC	.68319	1.00000	.21355	-.31621	.04111	-.37299	.56667	.50727	.31277
IMPACT	.15193	.21355	1.00000	-.26370	.52227	.05239	.43425	.26265	.26829
NOSPE	-.20337	-.31621	-.26370	1.00000	-.45889	-.14152	-.11692	.18726	-.65118
QUADIF	.04175	.04111	.52227	-.45889	1.00000	.61510	.21633	-.03133	.39422
AVER	-.20531	-.37299	.05239	-.14152	.61510	1.00000	-.13631	-.30957	.25173
COMPEN	.37941	.56667	.43425	-.13692	.20433	-.13631	1.00000	.62360	.19710
PCTLEP	.34997	.50727	.26265	.18726	-.03133	-.30957	.62360	1.00000	-.06628
PCTSPF	.15526	.31277	.26829	-.65118	.39422	.25173	.19710	-.06628	1.00000

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REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
FACTOR ANALYSIS -- ALL SCHOOLS

25 JAN 80 19.37.49.

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DETERMINANT = .0113990 ( .13889825E-11)

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INVERSE OF CORRELATION MATRIX..

81.42

	TITLE	LOWINC	IMPACT	NOSPE	QUADIF	AVER	COMPEN	PCTLEP	PCTSPE
TITLE	1.91236	-1.42154	-.37598	.39727	.00953	-.11163	.34576	.01194	-.26537
LOWINC	-1.42154	3.34263	.37663	.26493	-.31713	.93514	-.65737	-.63949	-.86412
IMPACT	-.37598	.37663	1.53071	-.14533	-1.27093	.71363	-.39376	-.22731	-.32044
NOSPE	.39727	.26493	-.14533	2.19852	1.23145	-.61363	-.13751	-.27722	1.13404
QUADIF	.00953	-.31713	-1.27093	1.23145	3.36221	-2.11303	-.37731	.11932	.43415
AVER	-.11163	.93514	.71363	-.61363	-2.10303	2.75675	.15870	.03134	-.81449
COMPEN	.34576	-.65737	-.39376	-.13751	.15370	2.22097	-.91912	-.13000	-.31474
PCTLEP	.01194	-.63949	-.22731	-.27722	.11932	.03134	-.91912	2.00911	.31474
PCTSPE	-.26537	-.86412	-.32044	1.13404	.43415	-.81449	-.13000	.34434	2.16444



REDDING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS --ALL SCHOOLS  
 FILE NGRAME (CREATION DATE = 26 JAN 92)

25 JAN 92 13.31.44. PAGE 2

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VARIABLE	EST COMMUNALITY	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
TITLE	.47722	1	3.11429	14.5	14.5
LOWINC	.71193	2	2.36917	25.3	40.0
IMPACT	.45376	3	1.23118	13.3	53.2
NOSPE	.54397	4	.67835	7.5	60.7
QUADIF	.71240	5	.57537	6.1	66.8
AVER	.63725	6	.37495	4.2	71.0
COMPEN	.54375	7	.32241	3.5	74.5
PCTLEP	.50224	8	.22854	2.5	77.0
PCTSFE	.53395	9	.14586	1.5	78.5

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REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS -- ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26 JAN 32)

26 JAN 82 13.3 .44.

PAGE 11

FACTOR MATRIX USING PRINCIPAL FACTOR WITH ITERATIONS

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TITLE	.56461	-.26221	-.14778
LOWINC	.82147	-.35767	-.26497
IMPACT	.51772	.21847	.28902
NOSPE	-.59776	-.46781	.34982
QUADIF	.44663	.78973	.34541
AVER	-.10672	.69901	.16933
COMPEN	.71433	-.22603	.29946
PCTLEP	.53414	-.46733	.35398
PCTSFE	.49275	.45515	-.35024

CONVERGENCE REQUIRED 19 ITERATIONS.

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VARIABLE	COMMUNALITY	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
TITLE	.41334	1	2.75643	44.3	44.8
LOWINC	.87279	2	2.05204	36.1	80.2
IMPACT	.39137	3	.83475	14.3	100.0
NOSPE	.64391				
QUADIF	.74255				
AVER	.52968				
COMPEN	.65177				
PCTLEP	.62448				
PCTSFE	.57938				

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REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS --ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26 JAN 82)

25 JAN 82 19.30.40. PAGE 11

ROTATION FOR DIRECT OBLIMIN LOADINGS

DELTA = -1.333

ITERATION CRITERION

	9.621896
1	9.514438
2	9.288329
3	9.220752
4	9.733910
5	8.452034
6	9.193592
7	7.974763
8	7.811062
9	7.76085
10	7.647450
11	7.617217
12	7.601671
13	7.592770
14	7.586966
15	7.582556
16	7.578875
17	7.575661
18	7.572823
19	7.570306
20	7.568097
21	7.566191
22	7.564446
23	7.562978
24	7.561712
25	7.560627

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81.42

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OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -1.000

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TIME	.97163	-.22097	-.33869
LOWINC	.64936	-.33934	-.48839
IMPACT	.93445	.43280	-.19676
NOSPE	.04304	-.12459	.77629
QUADIF	.15721	.86463	-.24154
AVER	-.31754	.61945	-.37890
COMPEN	.80147	.14037	-.31579
PCTLEP	.80241	-.02360	.21542
PCTSFE	-.02607	.14961	-.72112

FACTOR PATTERN CORRELATIONS

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	FACTOR 1	FACTOR 2	FACTOR 3
FACTOR 1	1.00000	-.07385	-.20576
FACTOR 2	-.07386	1.00000	-.19604
FACTOR 3	-.20575	-.19604	1.00000

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 (Page 13 of 24)

REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS -- ALL SCHOOLS  
 FILE HQNAME (CREATION DATE = 26 JAN 92)

25 JAN 82 13.39.48. PAGE 13

OBLIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION.

DELTA = -1.039

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TITLE	.54342	-.19686	-.35442
LOWINC	.77463	-.29124	-.55547
IMPACT	.92241	.41967	-.27100
NOSPE	-.10249	-.28032	.79183
QUADIF	.13457	.92133	-.14587
AVER	-.34716	.65837	-.13500
COMPEN	.79435	.08426	-.21822
PC1LEF	.75982	-.12511	.15494
PCISFE	.11127	.29291	-.74515

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ROTATION FOR DIRECT OULIMIN LOADINGS DELTA = -.590

ITERATION CRITERION

81.42

1	6.899022
2	6.760017
3	6.443619
4	6.775656
5	5.711821
6	5.393293
7	5.151438
8	5.007837
9	4.942162
10	4.915191
11	4.902372
12	4.894156
13	4.887651
14	4.882109
15	4.877352
16	4.873321
17	4.869955
18	4.867184
19	4.864931
20	4.863117
21	4.861670
22	4.861524
23	4.859621
24	4.858914
25	4.858362
26	4.857933

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REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
FACTOR ANALYSIS --ALL SCHOOLS  
FILE NONAME (CREATION DATE = 26 JAN 92)

25 JAN 82 19.30.40.

PAGE 15

OBLIQUE FACTOR PATTERN MATRIX  
AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -.533

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
ITILE	.44232	-.24646	-.31226
LOWINC	.60375	-.37519	-.51239
IMPACT	.45619	.41452	-.10223
NOSPE	.06723	-.11814	.78322
QUADIF	.19382	.87934	-.24378
AVER	-.27677	.63350	-.37418
COMPEN	.80355	.10544	-.12581
PCTLEF	.80137	-.05653	.21733
PCTSFE	-.04195	.14286	-.72778

FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3
FACTOR 1	1.00000	-.09778	-.23522
FACTOR 2	-.09778	1.00000	-.19063
FACTOR 3	-.23522	-.19063	1.00000

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OBLIQUE FACTOR STRUCTURE MATRIX  
AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -.500

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
ITILE	.53941	-.23055	-.16732
LOWINC	.75963	-.33844	-.57288
IMPACT	.43956	.38942	-.29852
ROSPE	-.12541	-.27392	.78990
QUAQIF	.17119	.90633	-.45818
AVER	-.32146	.67671	-.13022
COMPEN	.79235	.03172	-.23493
PCTLEF	.75474	-.17453	.12948
PCTSFE	.11535	.28569	-.74517

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REDUCTION FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
FACTOR ANALYSIS---ALL SCHOOLS  
FILE NONAME (CREATION DATE = 26 JAN 82)

25 JAN 82 17.30.49.

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ROTATION FOR DIRECT OBLIQUE LOADINGS

DELTA =

0

ITERATION CRITERION

81.42

	4.177148
1	3.967657
2	3.453676
3	2.915419
4	2.491963
5	2.280306
6	2.223408
7	2.203417
8	2.188121
9	2.175051
10	2.164597
11	2.156459
12	2.150618
13	2.146477
14	2.143639
15	2.141724
16	2.140447
17	2.139617
18	2.139054
19	2.138693
20	2.138459
21	2.138306
22	2.138207
23	2.138143
24	2.138101

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REDUING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS --ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26 JAN 82)

26 JAN 82 12.38.48. PAGE 10

OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA =

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
ITILE	.39842	-.28295	-.31920
LOWINC	.53579	-.42912	-.51642
IMFACT	.40575	.39161	-.09250
NOSPE	.79334	-.09580	.79878
QUADIF	.26653	.87101	-.23944
AVER	-.21376	.65426	-.06934
COMPEN	.80353	.26357	-.12434
PCTLEP	.80153	-.09198	.21207
FCTSFE	-.06323	.12143	.74186

FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3
FACTOR 1	1.00000	-.13547	-.29184
FACTOR 2	-.13547	1.00000	-.19879
FACTOR 3	-.29184	-.19879	1.00000

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READING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS --ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26, JAN 32)

25 JAN 82 17.39.40. PAGE 19

OBLIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA =

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TITLE	.52383	-.27350	-.37913
LOWINC	.74449	-.39804	-.58768
IMPACT	.46174	.34559	-.31911
NOSPE	-.12133	-.26798	.78808
GUADIF	.21960	.88149	-.49018
AVER	-.28716	.69768	-.13555
COMPEN	.80416	-.04062	-.27249
PCTLEF	.75215	-.24272	-.30358
PCTSEE	.13192	.27819	-.74610

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ROTATION FOR DIRECT ORIGIN LOADINGS

DELTA = .521

ITERATION CRITERION

	1.455275
1	.991429
2	-.150345
3	-.533991
4	-.623645
5	-.797628
6	-.389474
7	-.912874
8	-.719714
9	-.922362
10	-.923491
11	-.923982
12	-.924199
13	-.924295
14	-.924339
15	-.924357
16	-.924356

81.42

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REDOING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
 FACTOR ANALYSIS -- ALL SCHOOLS  
 FILE NONAME (CREATION DATE = 26 JAN 82)

23 JAN 82 19.3 .49. PAGE 21

OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = .50

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TITLE	.23341	-.43341	-.38471
LOWIAC	.27743	-.65594	-.62969
IMPACT	.61233	.35522	.12184
NUSPE	.24533	.16776	.32918
GLADIF	.52722	.47765	-.17123
AVER	-.03455	.73495	.12693
COMPEN	.33943	-.22672	.13189
ECTLEF	.43163	-.14416	.32675
ECTSFE	-.19223	-.12354	-.35347

#### FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3
FACTOR 1	1.00000	-.21134	-.51237
FACTOR 2	-.21134	1.00000	-.34737
FACTOR 3	-.51237	-.34737	1.00000

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OBLIQUE FACTOR STRUCTURE MATRIX  
AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = .516

81.42

	FACTOR 1	FACTOR 2	FACTOR 3
TITLE	.52229	-.34324	-.35374
LOWINC	.73341	-.49670	-.51388
IMPACT	.52523	.21831	-.41574
NOSPE	-.24493	-.30699	.78112
QUADIF	.37344	.79194	-.54680
AVER	-.17403	.72655	-.22604
COMPEN	.80269	-.23293	-.33927
PCTLEF	.69536	-.43349	-.35103
PCTSFE	.25149	.30765	-.74479

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READING FACTOR ANALYSES WITH SIZE OF SCHOOL REMOVED  
FACTOR ANALYSIS --ALL SCHOOLS

25 JAN 82

10.34.40.

CASE 23

CPU TIME REQUIRED.. .6093 SECONDS

FINISH

TOTAL CPU TIME USED.. .9283 SECONDS

RUN COMPLETED

NUMBER OF CONTROL CARDS READ 82

NUMBER OF ERRORS DETECTED 0

81.42

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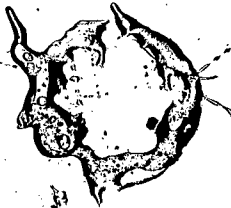
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Attachment D-3

Elementary Teacher Staffing Formula

Page 1 of 12





AUSTIN INDEPENDENT SCHOOL DISTRICT  
Office of Research and Evaluation

January 28, 1982

TO: Persons Addressed  
FROM: David Doss  
SUBJECT: Elementary Teacher Staffing Formula

The attached pages provided documentation for the approach to allocating elementary teaching positions which we will discuss today.

DD:trf  
Attachments.

Approved: *Zeda M. Hollis*  
Director, Office of Research and Evaluation

Persons Addressed: Ruth MacAllister  
Hermelinda Rodriguez  
Perry Jackson

AUSTIN INDEPENDENT SCHOOL DISTRICT  
Office of Research and Evaluation

ELEMENTARY TEACHER STAFFING FORMULA

The staffing formula described below was developed as a mechanism to aid in the equitable distribution of District resources to schools in accordance with their needs.

The formula is in the basic structure given below.

$$\text{TEACHERS} = \text{BASE} + \text{ADJUSTMENT}$$

The BASE portion of the formula allocates an initial number of teachers to each school based on enrollment.

The ADJUSTMENT portion of the formula then "fine tunes" the allocation by adding to or subtracting from the original number in accordance with certain characteristics of the student population. The sum of the adjustments is zero; i.e., the adjustment does not add to the total staff districtwide but redistributes them within predetermined limits.

To use this approach, the District must make the decisions listed below. The formula does the rest.

Decision Questions

1. How many teachers are to be employed?
2. What are the minimum and maximum pupil/teacher ratios (PTR's) that will be acceptable?
3. What variables are to be used in fine tuning or adjusting the original allocation?
4. What should be the relative importance of these variables in making the adjustment? For example, should the percentage of low-income students count 1.5 times or only half as much as the achievement diversity of the students?

The paragraphs below describe the development of the elementary teacher staffing formula and the impact of the formula on the number of teachers assigned to each school. There were four major steps in the analyses.

Step One: The first step was to develop a list of variables that might possibly be used in the formula and to build a file of data for analyses based on these variables.

Step Two: Step two was to statistically cluster the variables and to select the ones to use in the formula. The number of variables that can be considered is much greater than the number that can be used efficiently

in a formula. Statistical procedures were used to cluster variables which were different measures of the same "factor" or influence, so a single measure could be chosen to represent the whole group.

Step Three: The third step is the determination of the relative impact each variable should have on the fine tuning performed by the formula. At the present time the relative importance of the factors can best be determined by a "seat of the pants" decision based on experience and judgment. The relative importance of the factors is expressed in numerical form.

Step Four: The final step is to use the ratios of importance from step three with the formula to produce an allocation. The ratios are used to set weights in the formula. The values of the weights are set so that:

- a. they are true to the ratios from step three (e.g., if one factor is thought to be twice as important as another, the weights used will always maintain a two-to-one ratio),
- b. they maximize the adjustment without exceeding predetermined minimum or maximum student/teacher ratios.

When an allocation has been made, it is in fractional form. The results are then rounded to the nearest whole number of teachers.

#### Results

1. The variables used can be found in Figure 1. The figure also shows how the variables clustered in the statistical analysis.
2. The formula developed from the results is as follows:

$$\begin{array}{c} \text{Number of} \\ \text{Teachers} \end{array} = \overbrace{(\text{Enrollment}/25)}^{\text{BASE}} + \overbrace{.399(\text{LZ}) + .133(\text{AZ}) + .266(\text{SZ})}^{\text{ADJUSTMENT}}$$

where,

Enrollment/25 = the basic allotment

LZ = the school's percent low income expressed as a z-score,

AZ = the diversity of achievement found at the school expressed as a z-score,

SZ = the school's percentage of students served by special education expressed as a z-score.

The results of using the formula can be seen in Figures 2 - 4.

COMMENTS

1. The weights were chosen for the formula in such a way as to maximize the adjustment. However, no school was permitted to have a PTR (enrollment + unrounded projection) of greater than 30/1 or less than 20/1. Summit proved to be the limiting school. Weights of any greater size would have produced a PTR that exceeded the limit at Summit. If it is desirable for the adjustment to be more potent in its effect, then special rules need to be developed for dealing with extreme schools like Summit.
2. It should not be forgotten that changing the relative weights of the variables will alter the outcome somewhat.

### Variables Used In Analyses

- Factor 1:           School Size  
                    Enrollment
- Factor 2:           Educational and Economic Deprivation  
                    Percent Low-Income Students  
                    Number of Compensatory Education Programs  
                    Percentage of Students who are LEP  
                    Does the School Have a Title I Program?
- Factor 3:           Student Diversity  
                    Student Achievement Diversity  
                    Average Achievement Level  
                    Was the School Impacted by Desegregation?
- Factor 4:           Special Education  
                    Percentage of Students Served By Special Education  
                    Average Number of Minutes Students are Not Receiving  
                    Special Education Services

Figure 1: VARIABLES USED IN ANALYSES.

School	Enrollment	Number of Teachers		Student/Teacher Ratio		Base	+ Adjustment	= Projection
		Actual	Projected	Actual	Projected			
Allison	405	27	17	15	24	16.20	.37	16.57
Andrews	647	24	26	27	25	25.88	-.10	25.78
Barton Hills	262	11	10	24	26	10.48	-.02	10.46
Becker	639	41	26	16.	25	25.56	.69	26.25
Blackshear	452	17	18	27	25	18.08	.39	18.47
Blanton	521	18	21	29	25	20.84	.15	20.99
Brentwood	254	11	10	23	25	10.16	-.23	9.93
Brooke	419	16	17	26	25	16.76	.38	17.14
Brown	483	20	20	24	24	19.32	.55	19.87
Bryker Woods	238	10	10	24	24	9.52	.29	9.81
Campbell	492	19	20	26	25	19.68	.23	19.91
Casis	406	17	17	24	24	16.24	.45	16.69
Cunningham	671	25	26	27	26	26.84	-.50	26.34
Dawson	660	25	27	26	24	26.40	1.05	27.45
Govalle	670	26	27	26	25	26.80	-.05	26.75
Gullett	384	15	16	26	24	15.36	.14	15.50
Harris	595	21	24	28	25	23.80	.38	24.18
Highland Park	566	16	14	23	26	14.64	-.23	14.41
Joslin	731	28	29	26	25	29.24	-.36	28.88
Lee	301	13	11	23	27	12.04	-.66	11.38
Maplewood	400	18	17	22	24	16.00	.84	16.84
Mathews	385	16	16	24	24	15.40	.36	15.76
Metz	446	19	18	23	25	17.84	-.16	17.68
Oak Springs	520	21	21	25	25	20.80	.53	21.33
Ortega	326	13	14	25	23	13.04	.99	14.03
Sanchez	397	16	16	25	25	15.88	.23	16.11
Pease	284	12	11	24	26	11.36	-.72	10.64
Pecan Springs	340	14	14	24	24	13.60	.43	14.03
Pleasant Hill	599	25	24	24	25	23.96	-.42	23.54
Read	418	15	16	28	26	16.72	-.44	16.28
Reilly	327	13	14	25	23	13.08	.74	13.82
Ridgetop	274	11	11	25	25	10.96	.28	11.24
Rosedale	244	9	11	27	22	9.76	.90	10.66
Rosewood	141	6	6	24	24	5.64	.47	6.11
St. Elmo	657	26	27	25	24	26.28	.24	26.52
Summitt	238	9	7	24	31	8.72	-1.52	7.20
Sims	277	12	11	23	25	11.08	.24	11.32
Travis Heights	627	25	25	25	25	25.08	.24	25.32

Figure 2: RESULTS OF APPLYING ELEMENTARY STAFFING FORMULA. (Page 1 of 2)

School	Enrollment	Number of Teachers		Student/Teacher Ratio		Base	+ Adjustment	= Projection
		Actual	Projected	Actual	Projected			
Walnut Creek	291	12	12	24	24	11.64	.15	11.79
Allan	564	25	23	23	25	22.56	.27	22.83
Wooten	443	17	18	26	25	17.72	.71	18.43
Zavala	475	18	19	26	25	19.00	.43	19.43
Zilker	506	21	20	24	25	20.24	.10	20.34
Menchaca	481	19	18	25	27	19.24	-1.00	18.24
Oak Hill	737	30	28	25	26	29.48	-1.47	28.01
Barrington	496	19	20	26	25	19.84	-.08	19.76
Norman	257	12	10	21	26	10.28	.20	10.48
Pillow	370	16	14	23	26	14.80	-1.03	13.77
Wooldridge	544	20	22	27	25	21.76	.29	22.05
Doss	605	24	23	25	26	24.20	-1.52	22.68
Hill	386	15	14	26	28	15.44	-1.32	14.12
Odom	868	32	34	27	26	34.72	-.24	34.48
Winn	598	23	24	26	25	23.92	.00	23.92
Sunset Valley	506	21	20	24	25	20.24	.01	20.25
Graham	320	13	12	25	27	12.80	-.46	12.34
Linder	588	23	24	26	25	23.52	.08	23.60
Cook	632	22	25	29	25	25.28	.08	25.36
Houston	928	35	37	27	25	37.12	-.29	36.83
Williams	853	33	33	26	26	34.12	-.95	33.17
Webb	746	27	30	28	25	29.84	-.09	29.75
Langford	745	29	30	26	25	29.80	-.09	29.71

Figure 2: RESULTS OF APPLYING ELEMENTARY STAFFING FORMULA. (continued, page 2 of 2)

School	Current Number	Projected by Formula		Projected by Enrollment	
		Actual	Rounded	Actual	Rounded
Allison	27	16.57	17*	16.20	16
Andrews	24	25.78	26	25.88	26
Barton Hills	11	10.46	10	10.48	10
Becker	41	26.25	26	25.56	26
Blackshear	17	18.47	18	18.08	18
Blanton	18	20.99	21	20.84	21
Brentwood	11	9.93	10	10.16	10
Brooke	16	17.14	17	16.76	17
Brown	20	19.87	20*	19.32	19
Bryker Woods	10	9.81	10	9.52	10
Campbell	19	19.91	20	19.68	20
Casfs	17	16.69	17*	16.24	16
Cunningham	25	26.34	26*	26.84	27
Dawson	25	27.45	27*	26.40	26
Govalle	26	26.75	27	26.80	27
Gullett	15	15.50	16*	15.36	15
Harris	21	24.18	24	23.80	24
Highland Park	16	14.41	14*	14.64	15
Joslin	28	28.88	29	29.24	29
Lee	13	11.38	11*	12.04	12
Maplewood	18	16.84	17*	16.00	16
Mathews	16	15.76	16*	15.40	15
Metz	19	17.68	18	17.84	18
Oak Springs	21	21.33	21	20.80	21
Ortega	13	14.03	14*	13.04	13
Sanchez	16	16.11	16	15.88	16
Pease	12	10.64	11	11.36	11
Pecan Springs	14	14.03	14	13.60	14
Pleasant Hill	25	23.54	24	23.96	24
Read	15	16.28	16*	16.72	17
Reilly	13	13.82	14*	13.08	13
Ridgetop	11	11.24	11	10.96	11
Rosedale	9	10.66	11*	9.76	10
Rosewood	6	6.11	6	5.64	6
St. Elmo	26	26.52	27*	26.28	26
Summitt	9	7.20	7*	8.72	9
Sims	12	11.32	11	11.08	11
Travis Heights	25	25.32	25	25.08	25
Walnut Creek	12	11.79	12	11.64	12
Allan	25	22.83	23	22.56	23
Wooten	17	18.43	18	17.72	18
Zavala	18	19.43	19	19.00	19
Zilker	21	20.34	20	20.24	20
Menchaca	19	18.24	18*	19.24	19
Oak Hill	30	28.01	28*	29.48	29
Barrington	19	19.76	20	19.84	20
Norman	12	10.48	10	10.28	10
Pillow	16	13.77	14*	14.80	15
Wooldridge	20	22.05	22	21.76	22
Doss	24	22.68	23*	24.20	24
Hill	15	14.12	14*	15.44	15

\*. Formula made a difference in allocation.

Figure 3: COMPARISONS OF PROJECTED ALLOCATIONS OF TEACHERS BASED ON THE FULL STAFFING FORMULA AND ON ENROLLMENT ONLY. (Page 1 of 2)



School	Current Number	Projected by Formula		Projected by Enrollment	
		Actual	Rounded	Actual	Rounded
Odom	32	34.48	34 *	34.72	35
Winn	23	23.92	24	23.92	24
Sunset Valley	21	20.25	20	20.24	20
Graham	13	12.34	12 *	12.80	13
Linder	23	23.60	24	23.52	24
Cook	22	25.36	25	25.28	25
Houston	35	36.83	37	37.12	37
Williams	33	33.17	33 *	34.12	34
Webb	27	29.75	30	29.84	30
Langford	29	29.71	30	29.80	30

\* Formula made a difference in allocation.

Figure 3: COMPARISONS OF PROJECTED ALLOCATIONS OF TEACHERS BASED  
ON THE FULL STAFFING FORMULA AND ON ENROLLMENT ONLY.  
(continued, page 2 of 2)

School	Number of Teachers		Enrollment	Percent Low Income	Percent Special Education	Achievement Diversity
	Current Number	Projected by Formula				
Allison	27	17	405	96	.06	1.07
Andrews	24	26	647	52	.07	1.68
Barton Hills	11	10	262	46	.10	1.62
Becker	41	26	639	92	.09	1.54
Blackshear	17	18	452	62	.12	2.26
Blanton	18	21	521	53	.12	2.06
Brentwood	11	10	254	52	.07	1.29
Brooke	16	17	419	64	.09	2.89
Brown	20	20	483	71	.11	1.62
Bryker Woods	10	10	238	59	.07	2.19
Campbell	19	20	492	72	.07	2.40
Casis	17	17	406	61	.09	2.14
Cunningham	25	26	671	32	.09	2.02
Dawson	25	27	660	81	.16	1.57
Govalle	26	27	670	76	.04	1.39
Gullett	15	16	384	42	.12	2.71
Harris	21	24	595	62	.09	1.76
Highland Park	16	14	366	42	.07	1.74
Joslin	28	29	731	42	.08	1.57
Lee	13	11	301	38	.07	1.43
Maplewood	18	17	400	78	.11	1.73
Mathews	16	16	385	75	.07	1.69
Metz	19	18	446	73	.03	1.42
Oak Springs	21	21	520	83	.08	1.51
Ortega	13	14	326	63	.16	2.90
Sanchez	16	16	397	69	.06	1.80
Pease	12	11	284	41	.03	1.60
Pecan Springs	14	14	340	69	.11	1.40
Pleasant Hill	25	24	599	40	.08	1.56
Read	15	16	418	32	.07	2.74
Reilly	13	14	327	56	.14	1.82
Ridgetop	11	11	274	79	.06	1.61
Rosedale	9	11	244	74	.17	1.91
Rosewood	6	6	141	84	.09	1.28
St. Elmo	26	27	657	49	.12	1.65
Summit	9	7	218	12	.01	1.34
Sims	12	11	277	69	.08	1.59
Travis Heights	25	25	627	61	.09	1.68
Walnut Creek	12	12	291	62	.10	1.98
Allan	25	23	564	66	.08	1.63
Wooten	17	18	443	59	.16	1.54
Zavala	18	19	475	61	.09	3.11
Zilker	21	20	506	52	.09	1.66
Menchaca	19	18	481	16	.06	1.60
Oak Hill	30	28	737	8	.04	1.43
Barrington	19	20	496	49	.09	2.24
Norman	12	10	257	74	.07	1.32
Pillow	16	14	370	24	.05	1.09
Wooldridge	20	22	544	53	.12	2.38
Doss	24	23	605	4	.04	1.46
Hill	15	14	386	7	.05	1.26

Figure 4: COMPARISON OF SCHOOLS ON VARIABLES USED IN STAFFING FORMULA. (Page 1 of 2)

School	Number of Teachers		Enrollment	Percent Low Income	Percent Special Education	Achievement Diversity
	Current Number	Projected by Formula				
Odom	32	34	868	42	.08	1.67
Winn	23	24	598	64	.05	1.69
Sunset Valley	21	20	506	52	.09	1.52
Graham	13	12	320	43	.07	2.01
Linder	23	24	588	64	.06	1.71
Cook	22	25	632	56	.09	2.36
Houston	35	37	928	50	.06	1.62
Williams	33	33	853	20	.07	1.50
Webb	27	30	746	46	.09	2.40
Langford	29	30	745	55	.07	1.66

Figure 4: COMPARISON OF SCHOOLS ON VARIABLES USED IN STAFFING FORMULA.  
(continued, page 2 of 2)

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# AUSTIN INDEPENDENT SCHOOL DISTRICT

DIVISION OF HUMAN RESOURCES

March 23, 1981

## MEMORANDUM

TO: Mr. Perry Jackson  
 FROM: Wayne A. King  
 SUBJECT: Proposed Staffing Formula for the 1981-82 School Year

I am proposing that we use the same staffing formula for 1981-82 as we did for this year.

### Regular Classroom Teachers:

Kindergarten and First Grade  
 Second and Third Grades  
 Fourth thru Sixth Grades

1:22 K-2.0, 1-2.6  
 1:26 2-24.2, 3-24.5  
 1:28 4-25.8, 5-26.6, 6-26.1

### Librarians:

Full Time Librarian - over 300 enrollment  
 Half Time Librarian - under 300 enrollment

### Special Area Teachers - Music, and Physical Education:

Kindergarten thru Third Grades - 1 Unit 300  
 Fourth thru Sixth Grades - 1 Unit 230

### Art:

Kindergarten thru Third Grades - None  
 Fourth thru Sixth Grades - 1 Unit 700

Band and Orchestra - Based on number of students who have enrolled in the program.

Sixth Grade Only - 1 Unit 260

Attached for your information are the following items: 1) Senate Bill No. 1 information, 2) memorandum to Dr. Gaines explaining the staffing formulas for 1980-81, and 3) teacher-pupil ratio for October 3, 1980.

dg  
 Att.

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## SPSS Control Cards For Setting Weights and Allocating Teachers

```

PAGESIZE      EJECT
RUN NAME      SETTING ELEMENTARY TEACHER WEIGHTS--MAYBE THE LAST TIME
VARIABLE LIST SCHOOL NUMSPE LOWINC1 LOWINC2 GRK GR1 TO GR6 QUADIF ENROL2
              TOTENRL LOWINC PCTSPE TYPE QUADIFZ SPEZ LOWINCZ
INPUT MEDIUM  DISK
N OF CASES    61
INPUT FORMAT  (2F3.2F6.3,7F3.F3.2,F3.F4.F2.F2.2,F1.3F5.3)
COMPUTE       WEIGHT=2.04
COMPUTE       WTL=WEIGHT*.3
COMPUTE       WTA=WEIGHT*.35
COMPUTE       WTS=WEIGHT*.1
COMPUTE       BASE=((GRK + GR1)/22)+((GR2 + GR3)/26)+((GR4+GR5+GR6)/28)
COMPUTE       ADJUST=(WTL*LOWINCZ)+(WTA*QUADIFZ)+(WTS*SPEZ)
COMPUTE       CORADJ=(TOTENRL/467.77)*ADJUST
COMPUTE       NUMTEACH=BASE + CORADJ
COMPUTE       UNPTR = TOTENRL/NUMTEACH
PRINT FORMATS QUADIF2 LOWINCZ SPEZ BASE ADJUST CORADJ NUMTEACH (3)
SELECT IF     (UNPTR GT 30 OR LT 20)
WRITE CASES   (3X,F3.5(SX,F5.3))SCHOOL NUMTEACH BASE ADJUST UNPTR
              CORADJ
FINISH

```

Attachment D-6

FACTOR ANALYSIS RESULTS FOR ASSISTANT PRINCIPAL FORMULA DEVELOPMENT

Page 1 of 24

\*\*\*\*\*  
 \* COMPUTATION CENTER \*  
 \* UNIVERSITY OF TEXAS AT AUSTIN \*  
 \*\*\*\*\*

S F S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

CDC 6000/CYBER 70 VERSION 8.3 - INSTALLED 27 AUGUST 80

PAGESIZE EJECT  
 RUN NAME GETTING FIGURES FOR ELEMENTARY FORMULA  
 VARIABLE LIST SCHOOL1 ENROL1 TO ENROL6 TITLE MIG SCE LEP LOWINC ATTEND IMPACT  
 NUMFK NUMF1 TO NUMF6 NUMTK NUMT1 TO NUMT4 SCHOOL2 NUMT5 NUMT6  
 NUMPREK NUMTEACH T7PREK LIBRAR MUSIC PE ART SPE NUNSP NOSP  
 FIRST1 TO FIRST3 SEC1 TO SEC3 THIRD1 TO THIRD3 FOUR1 TO  
 FOUR3 FIVE1 FIVE2 SCHOOL3 FIVE3 SIX1 TO SIX3 TYPE QUADIF CHANGE  
 AVER ENROLZ LOWINCZ, SPEZ, QUADIFZ, NUMPC, NUMSAR, NUMSPT, NUMRSP,  
 NUMSSC, NUMRC  
 INPUT MEDIUM DISK  
 INPUT FORMAT (3X,F3,6F4,3F1,F3,2F2,F1,12F3/3X,4F3,F2,F1,4F3,2,F1,2F3,14F3,2/  
 3X,F3,3F3,2,F4,2,F1,F4,2,F5,F3,2,4F4,2,F2,F3,F1,2F3,F2)

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
SCHGCL1	F 3. 0	1	4- 6
ENROL1	F 4. 0	1	7- 10
ENROL2	F 4. 0	1	11- 14
ENROL3	F 4. 0	1	15- 18
ENROL4	F 4. 0	1	19- 22
ENROL5	F 4. 0	1	23- 26
ENROL6	F 4. 0	1	27- 30
TITLE	F 1. 0	1	31- 31
MIG	F 1. 0	1	32- 32
SCE	F 1. 0	1	33- 33
LEP	F 3. 0	1	34- 34
LOWINC	F 2. 0	1	37- 38
ATTEND	F 2. 0	1	39- 40
IMPACT	F 1. 0	1	41- 41

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ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
NUMFK	F 3. 0	1	42- 44
NUMF1	F 3. 0	1	45- 47
NUMF2	F 3. 0	1	48- 50
NUMF3	F 3. 0	1	51- 53
NUMF4	F 3. 0	1	54- 56
NUMF5	F 3. 0	1	57- 59
NUMF6	F 3. 0	1	60- 62
NUM18	F 3. 0	1	63- 65
NUMT1	F 3. 0	1	66- 68
NUMT2	F 3. 0	1	69- 71
NUMT3	F 3. 0	1	72- 74
NUMT4	F 3. 0	1	75- 77
SGHCOL2	F 3. 0	2	4- 6
NUM15	F 3. 0	2	7- 9
NUMT6	F 3. 0	2	10- 12
NUMPREK	F 3. 0	2	13- 15
NUMTEACH	F 2. 0	2	16- 17
T7PREK	F 1. 0	2	18- 18
LIDRAR	F 3. 2	2	19- 21
MUSIC	F 3. 2	2	22- 24
PE	F 3. 2	2	25- 27
ART	F 3. 2	2	28- 30
SPE	F 1. 0	2	31- 31
NUMSPE	F 3. 0	2	32- 34
NOSPE	F 3. 0	2	35- 37
FIRST1	F 3. 2	2	38- 40
FIRST2	F 3. 2	2	41- 43
FIRST3	F 3. 2	2	44- 46
SBC1	F 3. 2	2	47- 49
SEC2	F 3. 2	2	50- 52
SEC3	F 3. 2	2	53- 55
THIRD1	F 3. 2	2	56- 58
THIRD2	F 3. 2	2	59- 61
THIRD3	F 3. 2	2	62- 64
FOUR1	F 3. 2	2	65- 67
FOUR2	F 3. 2	2	68- 70
FOUR3	F 3. 2	2	71- 73
FIVE1	F 3. 2	2	74- 76
FIVE2	F 3. 2	2	77- 79
SGHCOL3	F 3. 0	3	4- 6
FIVE3	F 3. 2	3	7- 9
SIX1	F 3. 2	3	10- 12
SIX2	F 3. 2	3	13- 15
SIX3	F 3. 2	3	16- 19
TYPE	F 1. 0	3	20- 20
QUADIF	F 4. 2	3	21- 24

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ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

VARIABLE	FORMAT	RECORD	COLUMNS
CHARGE	F 5. 0	3	25- 29
AVER	F 3. 2	3	30- 32
ENROLZ	F 4. 2	3	33- 36
LOWINCZ	F 4. 2	3	37- 40
SPEZ	F 4. 2	3	41- 44
QUADIFZ	F 4. 2	3	45- 48
NUMPC	F 2. 0	3	49- 50
NUMSAB	F 3. 0	3	51- 53
NUMSPT	F 1. 0	3	54- 54
NUMRSP	F 3. 0	3	55- 57
NUMSSC	F 3. 0	3	58- 60
NUMRC	F 2. 0	3	61- 62

THE INPUT FORMAT PROVIDES FOR 72 VARIABLES. 72 WILL BE READ.  
IT PROVIDES FOR 3 RECORDS (\*CARDS\*) PER CASE.  
A MAXIMUM OF 19 \*COLUMNS\* ARE USED ON A RECORD.

MISSING VALUES ALL (BLANK)

VAR LABELS

ENROL1, FIRST SIX WEEKS ENROLLMENT/  
ENROL2, SECOND SIX WEEKS ENROLLMENT/  
ENROL3, THIRD SIX WEEKS ENROLLMENT/  
ENROL4, FOURTH SIX WEEKS ENROLLMENT/  
ENROL5, FIFTH SIX WEEKS ENROLLMENT/  
ENROL6, SIXTH SIX WEEKS ENROLLMENT/  
TITLE, TITLE 1 PROGRAM ?/  
HIG, MIGRANT PROGRAM ?/  
SCE, SCE PROGRAM ?/  
LEP, NUMBER OF LEP STUDENTS/  
LOWINC, PERCENT LOW INCOME/  
ATTEND, PERCENT ATTENDANCE FOR 80-81/  
IMPACT, IMPACTED BY DESEGREGATION?  
NUMFK, ENROLLMENT FIRST SIX WEEKS KINDERGARTEN/  
NUMF1, ENROLLMENT FIRST SIX WEEKS FIRST GRADE/  
NUMF2, ENROLLMENT FIRST SIX WEEKS 2ND GRADE/  
NUMF3, ENROLLMENT FIRST SIX WEEKS 3RD GRADE/  
NUMF4, ENROLLMENT FIRST SIX WEEKS 4TH GRADE/  
NUMF5, ENROLLMENT FIRST SIX WEEKS 5TH GRADE/  
NUMF6, ENROLLMENT FIRST SIX WEEKS 6TH GRADE/  
NUMTK, ENROLLMENT THIRD SIX WEEKS KINDERGARTEN/  
NUMT1, ENROLLMENT THIRD SIX WEEKS 1ST GRADE/  
NUMT2, ENROLLMENT THIRD SIX WEEKS 2ND GRADE/  
NUMT3, ENROLLMENT THIRD SIX WEEKS 3RD GRADE/  
NUMT4, ENROLLMENT THIRD SIX WEEKS 4TH GRADE/  
NUMT5, ENROLLMENT THIRD SIX WEEKS 5TH GRADE/  
NUMT6, ENROLLMENT THIRD SIX WEEKS 6TH GRADE/  
NUMPREK, NUMBER OF PREK STUDENTS/  
NUMTEACH, NUMBER OF CLASSROOM TEACHERS/  
TYPREK, TITLE VII PRE-K ?/  
LIBRAR, NUMBER OF LIBRARIANS/  
MUSIC, NUMBER OF MUSIC TEACHERS/  
PE, NUMBER OF PE TEACHERS/  
ART, NUMBER OF ART TEACHERS/

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SPE,NUMBER OF SPECIAL ED TEACHERS/  
 NUMSPE,NUMBER OF SPECIAL ED STUDENTS/  
 NOSPE,AV # OF MINUTES NOT IN SPE/  
 FIRST1,1ST GRADE,1ST QUARTILE/  
 FIRST2,1ST GRADE,MEDIAN/  
 FIRST3,FIRST GRADE, 3RD QUARTILE/  
 SEC1,2ND GRADE, 1ST QUARTILE/  
 SEC2,2ND GRADE, MEDIAN/  
 SEC3,2ND GRADE, 3RD QUARTILE/  
 THIRD1,3RD GRADE, 1ST QUARTILE/  
 THIRD2,3RD GRADE, MEDIAN/  
 THIRD3,3RD GRADE, 3RD QUARTILE/  
 FOUR1,4TH GRADE, 1ST QUARTILE/  
 FOUR2,4TH GRADE, MEDIAN/  
 FOUR3,4TH GRADE, 3RD QUARTILE/  
 FIVE1,5TH GRADE, 1ST QUARTILE/  
 FIVE2,5TH GRADE, MEDIAN/  
 FIVE3,5TH GRADE 3RD QUARTILE/  
 SIX1,6TH GRADE, 1ST QUARTILE/  
 SIX2,6TH GRADE,MEDIAN/  
 SIX3,6TH GRADE 3RD QUARTILE/  
 QUADIF,MEAN DIFF BETWEEN 3RD & 1ST QUARTILES/  
 CHANGE,DIFF IN 1ST AND 3RD SIX YRS ENROLLMENT/  
 TYPE, GRADE SPAN 1=K-6,2=K-3,K-4,3=4-6,5-6/  
 AVER,AVERAGE OF MEDIAN TEST SCORES/  
 NUMPC,NUMBER OF PORTABLE CLASSROOMS/  
 NUMSAB,NUMBER OF STUDENTS ARRIVING ON BUS/  
 NUMSPT,NUMBER OF SPECIAL PROGRAM TEACHERS/  
 NUMRSP,NUMBER OF REGULAR SPECIAL EDUCATION STUDENT/  
 NUMSSC,NUMBER OF STUDENTS IN SELF-CONTAINED SP ED CLAS/  
 NUMRC,NUMBER OF REGULAR CLASSROOMS/  
 FREQUENCIES OF NEW VARIABLES  
 COMPEN=TITLE+MIG+SCE+TYPREK  
 PCTLEP=LEP/ENROL1  
 PCTSPE=NUMSPE/ENROL1  
 PCTPC=NUMPC/(NUMPC+NUMRC)  
 PCTSAB=NUMSAB/ENROL1  
 PCTSPT=NUMSPT/NUMTEACH  
 PCTSSC=NUMSSC/ENROL1  
 LIBRAR TO ART FIRST1 TO SIX3 QUADIF  
 AVER PCTSPE PCTLEP PCTPC PCTSAB PCTSPT PCTSSC (2)  
 VARIABLE=TITLE LOWINC IMPACT NOSPE QUADIF AVER COMPEN  
 PCTLEP PCTSPE PCTPC PCTSAB PCTSPT PCTSSC  
 TYPE=PA2/ROTATE=OBLIQUE/  
 DELTA=-1,.5,.5/  
 1,2,3,4,5,6

## TASK NAME

GOMPUTE

COMPUTE

COMPUTE

COMPUTE

COMPUTE

COMPUTE

COMPUTE

PRINT FORMAT

FACTOR

STATISTICS

READ INPUT DATA

00053500 CM NEEDED FOR FACTOR

END OF FILE ON FILE STAFFS  
 AFTER READING E1 CASLS FROM SUBFILE #JNAME

GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE NONAME (CREATION DATE = 22 FEB 82)

22 FEB 82 13.30.28. PAGE 5

VARIABLE	MEAN	STANDARD DEV	CASES
TITLE	.3934	.4926	61
LOWINC	54.5738	20.7135	61
IMPACT	.5246	.5035	61
NOSPE	265.3914	47.3945	61
QUADIF	1.7872	.4512	61
AVER	4.4534	1.2307	61
COMPEN	.9344	.8538	61
PCTLEP	.0663	.0716	61
PCTSPE	.0838	.0325	61
PCTPC	.1205	.1332	61
PCTSAB	.3062	.2436	61
PCTSPT	.1278	.1425	61
PCTSSC	.0138	.0498	61

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CORRELATION COEFFICIENTS

	TITLE	LOWINC	IMPACT	WOSPE	QUADIF	AVER	COMPLEN	PCTLEP	PCTSPE	PCTPC
TITLE	1.00000	.68019	.16193	-.20307	.04176	-.24531	.37941	.34997	.15596	-.13695
LOWINC	.68319	1.00000	.21355	-.31621	.04131	-.37099	.56667	.50027	.33277	-.13518
IMPACT	.16193	.21355	1.00000	-.26370	.52227	.06239	.43025	.42265	.26828	-.21583
WOSPE	-.20307	-.31621	-.26370	1.00000	-.45889	-.14152	-.13632	.08726	-.65108	-.13333
QUADIF	.04176	.04131	.52227	-.45889	1.00000	.61610	.20633	-.03183	.38422	-.03587
AVER	-.24531	-.37099	.06239	-.14152	.61610	1.00000	-.18631	-.30957	.25173	-.07768
COMPLEN	.37941	.56667	.43025	-.13632	.20633	-.18631	1.00000	.62360	.18918	-.19953
PCTLEP	.34997	.50027	.42265	.08726	-.03183	-.30957	.62360	1.00000	-.06608	-.16940
PCTSPE	.15596	.33277	.26828	-.65108	.38422	.25173	.18918	-.06608	1.00000	-.05172
PCTPC	-.13695	-.13518	-.21583	-.13333	-.03587	-.07768	-.19953	-.16940	-.05172	1.00000
PCTSAU	-.09158	-.20784	.50073	.19533	.25894	.01397	.11042	-.02646	-.18688	-.07867
PCTSPT	.74688	.65911	.37088	-.09347	.03632	-.32553	.48272	.48174	.18065	-.26549
PCTSSC	.08483	.03827	-.01811	-.13782	.00314	-.18702	-.07164	-.11979	.05222	-.09419

	PCTSAU	PCTSPT	PCTSSC
TITLE	-.09158	.74688	.08483
LOWINC	-.20784	.65911	.03827
IMPACT	.50073	.37088	-.01811
WOSPE	.19533	-.09347	-.13782
QUADIF	.25894	.03632	.00314
AVER	.01397	-.32553	-.18702
COMPLEN	.11042	.48272	-.07164
PCTLEP	-.02646	.48174	-.11979
PCTSPE	-.18688	.18065	.05222
PCTPC	-.07867	-.26549	-.09419
PCTSAU	1.00000	.10057	-.11360
PCTSPT	.10057	1.00000	-.04142
PCTSSC	-.11360	-.04142	1.00000

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GETTING FIGURES FOR ELEMENTARY FORMULA  
FREQUENCIES OF NEW VARIABLES

22 FEB 62

13.30.28.

PAGE

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DETERMINANT = .0014199 ( .14198875E-02)

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INVERSE OF CORRELATION MATRIX..

	TITLE	LOWINC	IMPACT	NOSPE	QUADIF	AVER	COMPEN	PCTLEP	PCTSPE	PCTPC
TITLE	3.10351	-1.18002	.34848	.49102	.12576	-.53215	-.01553	.17679	.61889	-.18343
LOWINC	-1.18002	3.64973	.15468	.17616	-.60495	1.22324	-.73914	-.40304	-.70657	-.04586
IMPACT	.34848	.15468	2.52922	.27530	-.93686	.31053	-.27992	-.38201	-.35946	.13996
NOSPE	.49102	.17616	.27538	2.55416	1.31957	-.93661	-.16026	-.37913	1.18414	-.26445
QUADIF	.12576	-.60495	-.93686	1.31957	3.84726	-2.61025	-.35533	-.15270	.37516	-.26443
AVER	-.53215	1.22324	.31053	-.93661	-2.61025	3.40338	.17230	.25317	-.87898	.20408
COMPEN	-.01553	-.73914	-.27992	-.16026	-.35533	.17230	2.26469	-.95678	-.23871	.13136
PCTLEP	.17679	-.40304	-.38201	-.37913	-.15270	.25317	-.95678	2.21012	.44877	.06957
PCTSPE	.61889	-.70657	-.35946	1.18414	.39516	-.87898	-.23871	.44877	2.31799	-.14082
PCTPC	-.18343	-.04586	.13996	-.26445	-.26443	.20408	.13136	.06957	-.14082	1.16188
PCTSA8	.01727	.68788	-.99814	-.62153	-.82722	.72811	-.20616	.55028	.27910	.03925
PCTSPT	-2.05603	-.55272	-.62041	-.66534	-.04820	.55617	.12676	-.38408	-.64345	.44015
PCTSSC	-.35678	.20006	-.06365	-.11252	-.50813	.73310	.09008	.21502	-.12699	.18154

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	PCTSA8	PCTSPT	PCTSSC
TITLE	.01727	-2.05603	-.35678
LOWINC	.68788	-.55272	.20006
IMPACT	-.99814	-.62041	-.06365
NOSPE	-.62153	-.66534	-.11252
QUADIF	-.82722	-.04820	-.50813
AVER	.72811	.55617	.73310
COMPEN	-.20616	.12676	.09008
PCTLEP	.55028	-.38408	.21502
PCTSPE	.27910	-.64345	-.12699
PCTPC	.03925	.44015	.18154
PCTSA8	2.12341	-.29480	.27653
PCTSPT	-.29480	3.65181	.35269
PCTSSC	.27653	.35269	1.24661

81.42

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE NONAMB (CREATION DATE = 22 FEB 82)

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VARIABLE	EST COMMUNALITY	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
ITILE	.67778	1	3.76136	28.9	28.9
LOWINC	.72631	2	2.45705	18.9	47.8
IMPACT	.60462	3	1.77274	13.6	61.5
NOSPE	.60848	4	1.14882	8.8	70.3
QUADIF	.74007	5	.87197	6.7	77.0
AVER	.70617	6	.78761	6.1	83.1
COMPEN	.55844	7	.68533	5.3	88.3
PCTLEP	.54754	8	.39527	3.0	91.4
PCTSPE	.56859	9	.35507	2.7	94.1
PCTPC	.13932	10	.24619	1.9	96.0
PCTSAH	.52906	11	.22731	1.7	97.8
PCTSPT	.72616	12	.17399	1.3	99.1
PCTSSC	.19783	13	.11729	.9	100.0

81.42

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FACTOR MATRIX USING PRINCIPAL FACTOR WITH ITERATIONS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.68187	-.16952	-.14783	.01388
LOWINC	.84299	-.18083	-.27854	.06010
IMPACT	.53201	.42954	.47867	-.20409
NOSPE	-.37026	-.55138	.47370	.24633
QUADIF	.24392	.81403	.15013	.10580
AVLR	-.28822	.73772	.01059	.43399
COMPEN	.70110	-.02249	.18871	.18399
PCTLEP	.59518	-.30468	.20334	.30565
PCTSPE	.36354	.51422	-.39979	-.06712
PCTPC	-.26061	-.00333	-.08753	.10564
PCTSAB	.03871	.17943	.74561	-.25063
PCTSPT	.78856	-.19021	.08506	-.01139
PCTSSC	.02165	-.01758	-.18339	-.29650

MORE THAN 25 ITERATIONS REQUIRED.

VARIABLE	COMMUNALITY	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
TITLE	.51572	1	3.40792	44.8	44.8
LOWINC	.82529	2	2.18097	28.7	73.5
IMPACT	.73832	3	1.41686	18.6	92.1
NOSPE	.72618	4	.60023	7.9	100.0
QUADIF	.75587				
AVLR	.81575				
COMPEN	.56151				
PCTLEP	.57941				
PCTSPE	.56092				
PCTPC	.08675				
PCTSAB	.65244				
PCTSPT	.66549				
PCTSSC	.12232				

81.42

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE 'IONAME' (CORRELATION DATE = 22 FEB 82)

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ROTATION FOR DIRECT CULMINA LOADINGS DELTA = -1.000

ITERATION CRITERION

0	14.029312
1	13.654107
2	13.158269
3	12.753844
4	12.544394
5	12.381218
6	12.276553
7	12.210845
8	12.168945
9	12.142238
10	12.124952
11	12.113434
12	12.105431
13	12.099561
14	12.095012
15	12.091308
16	12.088172
17	12.085443
18	12.083025
19	12.080861
20	12.078913
21	12.077154
22	12.075565
23	12.074129
24	12.072832
25	12.071663

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81.42

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OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -1.000

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TILL	.68743	.07296	-.08452	-.12784
LOWINC	.86018	.15874	-.26017	-.14038
IMPACT	.24501	.29355	.70312	-.00887
NOSPE	-.08440	-.74888	.05942	.34211
QUADIF	-.03305	.72576	.34907	.25740
AVER	-.37482	.61656	-.02682	.35570
COMPEN	.69486	.00414	.15953	.16962
PCTLEP	.73458	-.18307	.01454	.25505
PCTSPE	.14670	.69907	-.09775	-.15318
PCTPC	-.19640	-.02007	-.16295	.09300
PCTSAB	-.14216	-.15756	.80562	.34536
PCTSPI	.77279	-.01776	.13155	-.08471
PCTSSC	-.06346	.03990	-.00964	-.34709

FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000	.06689	.15272	-.13183
FACTOR 2	.06689	1.00000	.08705	-.05159
FACTOR 3	.15272	.08705	1.00000	.10908
FACTOR 4	-.13183	-.05159	.10908	1.00000

81.42

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE NONAME (CREATION DATE = 22 FEB 82)

22 FEB 82 13.30.28. PAGE 13

OBLIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -1.000

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.69525	.11807	.01286	-.23145
LOWINC	.85873	.20609	-.07030	-.28391
IMPACT	.37320	.37160	.76513	.02038
WJSPE	-.17051	-.76700	.01866	.39836
QUADIF	.03488	.74065	.43528	.26239
AVER	-.41093	.56049	.03023	.57038
COMPLN	.70249	.13535	.29148	.09108
PCTLEP	.69093	-.14583	.13861	.16924
PCTSPE	.19873	.70827	-.03120	-.21925
PCTPC	-.23488	-.05219	-.18454	.10215
PCTSAB	-.03565	-.09928	.77514	.16011
PCTSPT	.80287	.04975	.23879	-.17132
PCTSSC	-.01651	.05212	-.05372	-.34184

81.42

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ROTATION FOR DIRECT JBLIMIN LOADINGS DELTA = -.500

ITERATION CRITERION

0	9.573662
1	9.120206
2	8.529428
3	8.165531
4	7.956657
5	7.842394
6	7.781566
7	7.749180
8	7.731231
9	7.720423
10	7.713183
11	7.707833
12	7.703596
13	7.700106
14	7.697177
15	7.694699
16	7.692599
17	7.690822
18	7.689321
19	7.688054
20	7.686988
21	7.686093
22	7.685341
23	7.684712
24	7.684185
25	7.683744

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OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -.566

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.68703	.02501	-.09024	-.11934
LUMINC	.85867	.17350	-.20720	-.12561
IMPACT	.24707	.29133	.70241	.00077
NOSPE	-.01717	-.77054	.05725	.30267
QUADIF	-.03597	.70923	.35156	.28923
AVER	-.37858	.58297	-.02240	.58256
CUMPLE	.69676	.07750	.15349	.17546
PCTLEP	.73809	-.19381	.00705	.24881
PCTSPE	.14037	.71031	-.09662	-.11623
PCTPC	-.19717	-.02561	-.16153	.09207
PCTSAB	-.13641	-.16645	.80687	.02941
PCTSPT	.77462	-.00911	.12487	-.08234
PCTSSC	-.06507	.05978	-.00841	-.34410

FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000	.07559	.15372	-.13444
FACTOR 2	.07559	1.00000	.08484	-.04473
FACTOR 3	.15372	.08484	1.00000	.12448
FACTOR 4	-.13444	-.04473	.12448	1.00000

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UNIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = -.530

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.69563	.13953	.00773	-.22673
LOWINC	.85683	.22645	-.07612	-.27460
IMPACT	.37696	.36956	.76521	.04196
NCSPLE	-.16731	-.78505	.01769	.35464
QUADIF	.03280	.72340	.44220	.30611
AVER	-.41627	.52640	.04139	.60459
COMPLN	.70263	.13534	.28901	.09743
PCTLEP	.69108	-.14855	.13504	.15913
PCTSPE	.19484	.71793	-.02924	-.17890
PCTPC	-.23631	-.05834	-.18255	.09962
PCTSAB	-.02891	-.10962	.77544	.15563
PCTSPT	.80420	.06373	.23293	-.17353
PCTSSC	-.01559	.06954	-.05617	-.33907

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GETTING FIGURES FOR ELEMENTARY POPULA  
FREQUENCIES OF NEW VARIABLES  
FILE NONAME (CREATION DATE = 22 FEB 82)

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NOTATION FOR DIRECT COLIMIN LOADINGS DELTA = 0

ITERATION CRITERION

0	5.118011
1	4.466653
2	3.779469
3	3.490161
4	3.375643
5	3.334421
6	3.317735
7	3.308686
8	3.302680
9	3.298406
10	3.295330
11	3.293123
12	3.291549
13	3.290430
14	3.289638
15	3.289079
16	3.288684
17	3.288406
18	3.288211
19	3.288073
20	3.287976
21	3.287908
22	3.287861

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE HONAME (CREATION DATE = 22 FEB 82)

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OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KATSER NORMALIZATION

DELTA =

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.68857	.08787	-.09827	-.10629
LOWINC	.86082	.17657	-.21806	-.10583
IMPACT	.24472	.29310	.70016	-.00209
NUSPE	-.07180	-.77750	.05913	.28218
QUADIF	-.03750	.70502	.34709	.29978
AVER	-.37719	.57173	-.02593	.59287
COMPEN	.70026	.07476	.14337	.18427
PCTLEP	.74395	-.19871	-.00346	.25446
PCTSPE	.13727	.71376	-.10086	-.09532
PCTPC	-.19653	-.02793	-.16033	.09195
PCTSAB	-.13843	-.16607	.81153	.00817
PCTSPT	.77657	-.00672	.11651	-.07442
PCTSSC	-.06861	.06685	-.00470	-.34389

#### FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000	.08439	.16303	-.15122
FACTOR 2	.08439	1.00000	.08417	-.04842
FACTOR 3	.16303	.08417	1.00000	.15208
FACTOR 4	-.15122	-.04842	.15208	1.00000

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE NONAME (CREATION DATE = 22 FEB 82)

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13.37.28.

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OBLIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = 0

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.69504	.14287	.00522	-.22962
LOWINC	.85617	.23598	-.07896	-.27772
IMPACT	.38392	.37279	.76441	.05320
NUSPE	-.17048	-.79265	.02487	.33970
QUADIF	.03325	.71655	.44591	.32410
AYER	-.42283	.50901	.05086	.61829
COMPLEN	.70237	.13699	.29185	.09656
PCTLEP	.68814	-.14853	.13981	.15105
PCTSPE	.19548	.72147	-.03290	-.16597
PCTPC	-.23893	-.06246	-.18074	.09864
PCTSAB	-.02138	-.10984	.77623	.16057
PCTSPT	.80625	.07222	.23123	-.17391
PCTSSC	-.01173	.07731	-.06256	-.33747

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ROTATION FOR DIRECT COLUMN LOADINGS

DELTA = .500

ITERATION CRITERION

0	.662361
1	-.703874
2	-1.161764
3	-1.222092
4	-1.233266
5	-1.236239
6	-1.237011
7	-1.237205
8	-1.237253
9	-1.237265
10	-1.237267

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GETTING FIGURES FOR ELEMENTARY FORMULA  
 FREQUENCIES OF NEW VARIABLES  
 FILE NONAME (CREATION DATE = 22 FEB 82)

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OBLIQUE FACTOR PATTERN MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = .500

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	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
ITILE	.70656	.06115	-.12472	-.05282
LOWINC	.89384	.14492	-.25922	-.02457
IMPACT	.19158	.31839	.71698	-.06622
NOSPE	-.05525	-.75365	.05212	.27059
QUADIF	-.04172	.74466	.32471	.28449
AVER	-.32361	.62743	-.07570	.61417
COMPEN	.72290	.08405	.10073	.22438
PCTLEP	.78612	-.19129	-.05665	.31402
PCTSPE	.14209	.70177	-.11499	-.06539
PCTPC	-.18025	-.02372	-.16721	.10305
PCTSAB	-.21104	-.13034	.85733	-.10316
PCTSPT	.78122	-.02125	.09480	-.04154
PCTSSC	-.09960	.03989	.02903	-.36519

# FACTOR PATTERN CORRELATIONS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
FACTOR 1	1.00000	.11612	.22752	-.26169
FACTOR 2	.11612	1.00000	.04615	-.14256
FACTOR 3	.22752	.04615	1.00000	.30111
FACTOR 4	-.26169	-.14256	.30111	1.00000

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OBLIQUE FACTOR STRUCTURE MATRIX  
 AFTER ROTATION WITH KAISER NORMALIZATION

DELTA = .500

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
TITLE	.69941	.14757	.02307	-.28436
LOWINC	.85813	.24025	-.05656	-.35719
IMPACT	.40900	.38316	.75533	.05415
NGSPE	-.20172	-.79624	.08625	.40818
QUADIF	.04441	.71624	.43533	.28674
AVER	-.43869	.49764	.06229	.58923
COMPEN	.69686	.14066	.33664	.05356
PCTLEP	.66884	-.14738	.20793	.11851
PCTSPE	.21453	.72229	-.06997	-.23724
PCTPC	-.24802	-.06706	-.17829	.10325
PCTSAU	-.00412	-.10458	.77224	.22880
PCTSPT	.81119	.07976	.25905	-.21440
PCTSSC	.00720	.08172	-.10176	-.33607

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GETTING FIGURES FOR ELEMENTARY FORMULA  
FREQUENCIES OF NEW VARIABLES

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CPU TIME REQUIRED.. 1.1940 SECONDS

FINISH

TOTAL CPU TIME USED.. 1.5580 SECONDS

RUN COMPLETED

NUMBER OF CONTROL CARDS READ 95

NUMBER OF ERRORS DETECTED 0

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